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Planning for Profit Control When Volume Changes

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Changing volume levels constitute a major problem for management since a decline in income requires carefully planned action for expense reduction if the profit or loss under the changed conditions is to be controlled rather than the resultant of uncontrolled variables. This problem is particularly important when volume changes are large and sudden and a substantial proportion of costs is fixed. A method of planning action for volume changes which may reasonably be expected is outlined by the present author, so that decisions occasioned by them may be the result of careful and deliberate prior thinking.

TODAY'S PLANNING will determine tomorrow's profits. The period since 1939 has been marked by a series of economic events which created the highest demand for certain types of goods and services in the long history of our country. This condition cannot continue indefinitely and a change is inevitable. The logical expectation is a period of readjustment. For this reason executive managers must formulate plans and policies under which they may expect their businesses to prosper at lower levels of activity. The need for planning for changing business levels is thus becoming increasingly important.

The Situation in Which We Find Ourselves

When a readjustment period will begin is uncertain. Timing is largely dependent on world-wide developments. Should the present international situation be prolonged, readjustment would, in all probability, be more deliberate and less severe. However, should the prospect of international peace appear (not truce

but peace), the changes in defense spending would necessitate a more immediate and sudden adjustment. In any event plans should be made now.

There is no excuse for inaction. A delay in planning places us in the position of many who contend that the difficulty of predicting the future obviates the opportunity for long-term or short-range planning. The answer lies in flexibility of the type which military plans must possess. With this flexibility, incorrect assumptions and unpredicted developments do not destroy the eventual execution of the planned operation. Such flexibility in planning is achieved by frequent revision of plans and by a knowledge of what alternative courses of action must be taken to meet the requirements of interim developments, without abandoning the basic programs which have been developed. In the course of planning, it must be kept in mind that what we will wind up with is not precisely what is going to happen but how we should conduct our business at various levels of activity if certain profit results are to be achieved.

Few of our present executives and supervisors have experienced any extended period of normal demand for goods and services. Evolution of industry into its present state has been phenomenal. Little-known concerns have been thrust into national prominence and have undertaken and accomplished production miracles overnight. It has been a long time since we have had prolonged periods of keen competition. During the period of skyrocketing demand our economic structure has become increasingly complex. Industry has experienced numerous changes in practices, methods and policies. Merchandising chains with their vast buying power have modified the merchandising techniques of the nation. New tax laws, government regulations and labor relations have added to the complexity of business management. All of these complications have pyramided the responsibilities of the business executive and have focussed recognition on his importance in the guidance of our economic activity. The successful executive must have improved instruments of guidance and control at his command.

The accountant has the responsibility of consolidating the ideas, plans and objectives of many individuals into a master plan for future operations. As an example, sales management may think in terms of sales promotion activities. Its main interest may be in how much it can sell with the thought that maximum sales will return maximum profits. Production management may focus on the objective of obtaining the best equipment, regardless of cost. All of these single objectives and plans of individuals or departments must be integrated to insure the maximum income. In this process, the knowledge and experience of business executives who have lived through periods of business recession, must be used for the guidance of younger executives who are moving up.

What Profit Planning Is and Is Not

This article discusses the broad fundamentals of a basic plan for profits, with an eye to reduced production levels. Profit planning in its details may differ with the type of business. However, the basic ideas are the same for all types of business. Nevertheless, at the outset, it is well to mention that the pre-planning that is most familiar to me is based on the use of a standard cost system in the steel industry. This system, with its integrated cost controls, simplifies profit planning. However, the principles which will be expounded are applicable to most businesses with a sound system of accounting. My main purpose is to stimulate the idea of planning profits for changing business levels.

There is another point which should be clarified. The profit planning program is simply an evaluation and selection of a plan of action for each individual factor which contributes to the financial result. It involves no secret formulas, no short cuts and no change in cost principles. It should be clearly understood that the program is not a forecast of any change in volume of business. It is solely for the purpose of having approved plans of action for each segment of business when and if such changes in volume occur. It involves no prediction of change in rates of pay, prices of purchased goods and services, tax rates or future sales prices of products. The effects of these changes, as they occur, can be readily incorporated in the master plan.

Further, a profit planning program is not simply a program of determining break-even points. Development of break-even points does not constitute a plan of action for management to follow, but a profit planning program looks to providing for action in case of volume changes, regardless of the level at which a break-even point is reached.

Another condition to successful profit planning is to sell the desirability of such a program to executive management. The program must encompass all phases of the business in order to be successful. Its development involves all levels of management and supervision. For this reason, full cooperation of all personnel concerned is essential to its success.

Projecting Sales for Planning Purposes

The first step in the development of the plan is the determination of the volume levels to be used for profit projections. The selection of various levels will be influenced by the characteristics of a particular business. A manufacturer of luxury products may expect a relatively drastic change in his volume in periods of business recession. He might expect reductions to much lower volume levels than a business handling necessity items. For this reason, one company may elect

to project profits on a 20 per cent, 40 per cent and 60 per cent reduction in volume. Another concern may decide that two reduced levels are sufficient to guide it in future plans and may select 15 per cent and 30 per cent reductions. In larger organizations volume levels to be projected are developed by market research specialists and are subject to the approval of executive management. In smaller companies the chief executive, the sales executive and the comptroller ordinarily are those best equipped to handle such a problem in judgment.

The second step in planning profits at reduced volume levels is a forecast of sales by product line and by sales territories for each selected level. A business handling only one product line, one grade or size, automatically determines its sales when the volume level has been selected. However, this type of business is in the vast minority. A sales forecast requires progressively more consideration as there is an increase in the number of product lines, types of service or sales territories involved in a particular business. Under these conditions, an average reduction in total volume does not indicate an equal reduction in each commodity, service or sales territory.

Reduction in demand may be different for each of the product types constituting the total. For this reason, a sales forecast is a continuing responsibility of commercial research specialists. In a small business, it may not be given much thought during periods of peak demands. However, the projection is well worth the effort of those closest to sales problems. Sales forecasts are significant in any type or size of business. They are considered the foundation of sound profit planning.

Production and Cost Planning

The completion of a sales forecast at each selected average volume level brings us to the next steps in the plan. The remaining procedures will vary in concept and continuity depending on the type of business involved. A distributor of a product would be involved primarily in planning purchases for selected sales volumes. Main consideration of the dispenser of services would be selection of personnel. A manufacturer would be concerned with production planning in addition to purchased material requirements to produce a product. My subsequent discussion will cover a manufacturing industry in order to provide a broader coverage of the program development.

At this point in the program, the accountant takes over as the planning and coordinating medium. There is such a high degree of inter-relationship between the remaining phases of planning that coordination from one point is essential. This focal point is the accountant. As the various steps in development are pro-

jected, the importance of an efficient and aggressive accounting organization will be noted, including the necessity for complete cooperation between accountants and other functional areas of the business. The accountant's attitude should not be one of trying to substitute his knowledge for that of operators and other people involved. He should furnish facts and figures to aid various levels of management in developing their own plans, so that their vast knowledge and experience will be reflected in a sound, workable program.

Forecasting of sales by product lines establishes overall production for those operations producing finished goods. However, the final operation is usually only the last link in a series of operations required to produce the product. Also, material may be withdrawn at various points in the series of operations for conversion into other products. Alternative facilities may be available and there may be a choice of the number of operating shifts. Counsel of the accountant relative to cost and production statistics is thus most valuable to the operator in the selection of facilities and the coordination of the entire chain of operations. Also, he is responsible for the translation of the plan into accounting terms.

We have covered broadly the necessity for cooperation of accountants in production planning. Now let us have a look at the planning of costs attending the planned production. In this case, the accountant must solicit the aid of the operator. It is known by the accountant that certain costs are considered fixed, within reasonable limits, at a normal rate of operation. The amount by which fixed costs will deviate when these limits are exceeded must be determined jointly by accountants and operators. Each of the producing centers requires a certain number of services, rendered by general service groups, for each level of its operation. The accountant with assistance of the operator must develop quantities of services required in each operation for each volume level studied. The determination of these quantities is greatly facilitated by the use of standard costs set up in such a way that variances may be readily associated with standards to get actual costs in terms of useful group coverages.

Planning Goes Beyond Consideration of Sales and Production

Because coordination of the planning of costs is the accountant's special responsibility, he is very much interested in the extension of the planning processes to phases of the business besides sales and production. For example, purchasing of supplies, materials and equipment will undergo substantial changes with the advent of a buyer's market. During peak demands, it may be necessary to purchase materials of less desirable quality or from sources far removed from

operations, at higher freight costs. Removal of government controls may also affect material purchases. For these reasons the purchasing specialists must develop changes to result from selection of sources of supply, changes in quality and volume purchases. In many of these determinations, operating and engineering personnel must be consulted. Accountants must assist from the standpoint of maintaining minimum practicable costs and of inventory control.

Another factor to consider is the necessary manpower required. On the surface this appears to be a comparatively simple consideration, particularly in situations where standard crew quotas and flexible budgets are available. However, sound profit planning must go beyond the mere determination of the number of men required for a given operating level. Problems involving labor relations are now much more complex than they were during the last time business experienced a real recession. The development of lower labor requirements brings certain labor factors into focus which have a direct bearing on costs. Among the factors which require analyses are: employee status in regard to labor contracts, the effect of separations on unemployment taxes, liability for severance pay, and changes in pension provisions. In planning changes in operations where labor is affected, these factors should be given consideration. The projection of all changes must be fully weighed in the final plan.

Another area in profit planning is engineering. Planning of capital expenditures and retirement of property is the concern here. Engineering data is also essential for the development of depreciation, amortization, and guidance in property accounting. The accountant should consult with the engineers on both points and work the relevant information into the over-all plan.

This brings us to consideration of fixed costs, a substantial portion of what is commonly called overhead. This item of cost is of prime importance in the the cost planning phase. It will have been discussed in the direct manufacturing cost determinations. Also, it is equally significant in the inter-related executive, general administrative, sales and service departments. It is usually found that apparently fixed costs can be reduced at some level of volume.

Overhead cost, fixed and variable, may include administrative expense, supervision, selling expense, depreciation, taxes, rentals and other items. These costs call for a complete and exact review by all levels of supervision, in order to recognize and modify any changes which would result at selected volume levels. Sometimes cost increase will be in order. Under more competitive conditions, there may be instances in some business establishments where increased selling expense may be required to maintain a fixed reduced volume. The item of overhead requires a thorough study in any profit planning program.

Putting the Plans Together and Keeping Them Alive

The paragraphs which have gone before, have indicated what is needed in the terms of basic data for the preparation of statements embodying the results of planning at selected levels. This data is approved by the head of each staff function involved. Following approval, the plans are formalized and recorded for each segment of the business. The final result is a record of planned operating schedules, labor quotas, costs and other data. Each level of management is provided with a guide to determine the course of planned action. The plans are conveyed in progressively more summarized forms from the lower to higher levels of responsibility. Executive management is not burdened with details of the plans. Earnings statements for the selected planning levels are prepared for executives. These statements are accompanied by comprehensive analyses of major changes from current experience and pertinent statistical data. This overall summarized data is the master plan which executives can use as a basis for immediate or future decisions.

The usefulness of a program such as has been outlined depends largely on its maintenance. These approved plans of action cannot be allowed to stagnate. They must be kept up to date in line with changing conditions and be a matter of record for each operation, so that they will be usable when needed. There will be periodic changes in facilities, methods or processes in certain of the operations, which will necessitate revisions of plans. This emphasizes the necessity of frequent reviews by the accountant. Major changes in economic conditions, such as adjustments in general wage rates, general changes in sales prices of products, or general changes in prices of purchased goods and services, will necessitate a revision of expected profits but will not necessarily affect business plans. Maintenance of a live, usable program of planned profits is a responsibility of the accountant.

Profit Planning Lays A Foundation for Operating Studies

Benefits from, and uses of, a profit planning program are manifold. Business generally may be prone to accept the adage "get the volume and profits will take care of themselves." This is not good philosophy in a sellers' market or in normal times. Volume is not a substitute for planning. The business with plans has a decided advantage. Plans provide a guide for corrective action under changed conditions. Preplanning eliminates lost motion during a crisis.

A complete program of profit planning definitely raises the sights of an organization from top to bottom. Concrete goals to be attained have a stimulat-

ing effect on any organization. Planning of goals is most effective advertising for them. Advertising stimulates interest. Interest in the goals set in a planning program greatly facilitates their attainment. The stimulating effect of the program will be felt in all activities of the business.

Another benefit of a planning program is the teamwork that it inspires. The responsibilities and problems of each function in a business become more familiar to each participant in a profit planning program. There is no place in modern business for the attitude of some reportedly successful supervisors whose only concern is centered in their own operations. The interdependence of one operation on others is more pronounced today. Any move which fosters teamwork is assuredly worthwhile.

The extent of the vision and foresight of executive management constitutes the only limits to the uses of the basic profit plan. The future holds vast possibilities for improvement in quality of products, methods of manufacture and distribution at lower costs. The progressive manager is continually exploring the application of electronic principles, modern mechanical devices, and organizational improvements to enhance the competitive position of his business. A basic profit plan is a guidepost and springboard from which many determinations may be made. It is a realistic appraisal of what is likely to happen. As such, it may disclose weaknesses in the expected profit structure. These weaknesses are signs which point to special study requirements which can be initiated or coordinated by the accounting department.

As an illustration, if proposed changes in facilities are the subject of planning, the necessary extensive studies to determine economies of such changes are likely to be undertaken. Determinations of these economies at various levels of operations is desirable. Accuracy of the determinations depends largely on the quality of basic data used. Planning data approved by management, is a sound basis for these studies. As a further example, data is also highly useful in considering the desirability from the profit standpoint of changes in product lines. Basic cost data at changed levels available in each cost center can be developed readily for individual products. In much the same manner, changes in fixed and semi-fixed labor requirements developed in the plans for changing levels of operations, are useful in manpower requirement studies. These changes are recorded by occupations, which further enhances their value.

While the type of program to which this article is devoted is termed profit planning, its usefulness extends on into financial activities. From it may be determined availability of cash, changes in capital investment and dividend policy. It provides a guide to market studies to increase product lines, research and de-

velopment of new methods and processes, and the elimination of high cost equipment.

A Demand on Constructive Thinking

I have attempted to outline in a broad way the practical approach to the problem of profit planning for changing business conditions. Many successful business concerns have followed such a plan in one way or another without formalizing it. One or more plans or a program can be recorded for any business, depending on how it operates. A formalized and recorded plan permits each member of the management team to know in advance his definite responsibilities in a systematic adjustment when demand drops off. In this connection, the constant vigilance of the accountant is necessary in order that changing conditions within a business will be recognized and adjustments made in the master plan. Let me emphasize that this must be a live and current program, enthusiastically supported by executive management.

In conclusion, let me make it clear that their proper part in profit planning requires accountants to be men with imagination and vision. The chief accounting officer of an enterprise must assume his full responsibility, as part of management, in looking ahead. Profit planning is one area in which he can fully exercise this responsibility. He fails in his duties unless he encourages the development of well-considered plans to assure the financial soundness of his company during changes in business levels and businses conditions which we all know will occur.

Profit planning, properly executed, gives the accountant an added instrument to assist executives in shaping economic polices. It places him in an enviable position as a major influence in assuring the future success of business enterprise

Sales Forecasting and Marketing Cost Control

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This paper discusses the types of basic data needed for sales forecasts and other marketing cost problems. It then explores some of the means by which cost control standards may be set and used in the marketing field. It notes some of the differences between manufacturing and marketing cost control problems, including the fact that the standards used in the latter field are of a type basically different from those used in the former.

THERE ARE TWO BASIC RESPONSIBILITIES contained in budgeting sales and marketing costs. The factors affecting sales volume must be analyzed and integrated into the sales program and the techniques of marketing cost control must be understood and investigated. The first should be a logical corollary of the second. Where formal budgeting of marketing costs exists, adequate profit planning under fluctuating sales volume is greatly facilitated. To be more specific, the sales executive must, today, be provided with the following statistical information:

1. An analysis of past sales performances.
2. A study of factors indicative of the trend of business conditions.
3. A study of market potentials.
4. The development of base media for the control of marketing costs.

Facts of this type are needed to develop a dynamic marketing program which will assure maximum sales at minimum marketing costs. These facts will be kept continuously current to reflect changing business conditions.

SALES FORECASTING

It will be the purpose of this paper to consider, first, the three points (out of the foregoing four) which relate to sales forecasting and then to consider, at about equal length, the broad subject of marketing cost control after briefly distinguishing it from the entirety of distribution cost control. In treating sales forecasting, a somewhat survey-style presentation of the several aspects of the subject must necessarily be adopted in view of space limitations. Yet it will be attempted to direct the reader's thinking to advantage.

Making Past Performance Data Usable

The first step in pursuit of statistical data for our sales executive should be a thorough analysis of past sales performances. It might be well to mention

here that, in the development of sales statistical information, it is highly recommended that sales values and gross profit margins at standard costs be considered jointly. These past sales performance statistics might incorporate analysis by organizational divisions, by commodities, by channels of distribution, by territories, by salesmen, by methods of sale, by methods of delivery and service, and by size of orders. In fact, they should be in whatever categories are agreed upon between the sales executive and the accountant.

It is also necessary to recognize that the following three factors will usually affect the month-to-month sales of a given company:

1. Seasonal variations—the changes in sales which normally accompany the different seasons of the year.
2. Growth trend—the long-term tendency of sales to follow the pattern of general changes in population, wealth, and other demand factors.
3. General business cycles—the tendency of sales to follow the pattern of periodic changes in general business conditions.

If the seasonal fluctuations and the growth trend are statistically eliminated, it will be possible to establish a correlation between general business cycles and our own sales. This will show the effect of business cycles upon our sales.

Business Trend Data and Its Application

Political and economic changes throughout the world now reflect themselves in individual industries and businesses more quickly than ever before in the history of American industrial activity. Some of these factors are changes in political stability (both domestic and foreign), wars (hot or cold), governmental restrictions of materials, trade, and credit, etc. It is not possible to predict with any degree of accuracy the time and magnitude of movements related to these elements. However, it is possible to arm ourselves with such information as will afford warning in time to permit us to predict the effect these factors will have on the company's sales program. This prediction should not be made only in factors relating directly to our own concern but also to the industry of which the company is a part, and to the territories to be served.

There are two general methods of forecasting the trend of general business conditions in use by American business today. One method is for the major executive to use his judgment of what lies ahead, influenced and modified perhaps by the opinions of others. Many times these opinions are based upon past experiences or upon reviews of current literature bearing upon economic predictions. Indications are that well over ninety per cent of the business concerns in this country pursue this method. As a matter of fact, it is about the only method available to most small concerns.

The second method, followed by many medium-sized and large concerns, is for the company to develop its own facilities for economic analysis and to be guided largely by the product of its research. However, even with such analyses, considerable common-sense judgment is required. Although it may be desirable to make available many indices for statistical guidance, it will be necessary to select the ones which will offer the most current usefulness. History will not necessarily repeat iself in times of major political, social, or economic changes. Therefore, experienced judgment will be required to develop the relationship between these indices and a particular business. Examples of domestic economic indicators are gross national product, personal incomes, personal consumer expenditures, business expenditures for plant and equipment, Federal Reserve Board index of industrial production, and wholesale and retail price indices.

The Federal Government is the greatest collector of basic statistics and the best source of such information. Statistics are gathered and dispensed by many departments, bureaus, and commissions, including the Department of Agriculture, Department of Commerce, Bureau of the Census, Department of Labor, Bureau of Labor Statistics, Department of the Interior, Bureau of Mines, Federal Trade Commission, Board of Governors of the Federal Reserve System, Interstate Commerce Commission, and many others. Current statistical data from these sources are usually reported in financial journals, trade papers, and daily newspapers as soon as they are released by the collecting agencies.

In developing a specific procedure for relating the effect of general business conditions to the sales program of a company, the following several points should be taken into consideration:

1. The indices of general business conditions to be used should be the ones which are most nearly related to the company's business. Some companies have found it desirable to develop a composite of several individual indices using appropriate weighting factors.
2. An index or indices should be selected which are available as promptly as possible after the close of the period. Quick action is vital to the sales executive.
3. The index or indices selected should be ones which have been adjusted to eliminate seasonal and growth trends.
4. It is very important that some basis be developed for measuring the company's growth trend. This may be statistical information of the normal growth of the industry of which the company is a part or it may be similar information respecting the individual company's growth over a long period of time.
5. The base year or base period for expressing the growth trend should be the same as the one selected for measuring the general business activity.
6. It may be more desirable to reflect seasonal fluctuations on a monthly rather than on a quarterly basis.
7. It is very desirable to develop deviations occurring through several general business cycles rather than for just one such cycle. This will afford a much more dependable guide for the measurement of the current activity.
8. Although it is generally more convenient to deal with dollar sales of the individual company, it might be possible to develop a similar set of statistics on physical relationships. In such instances, of course, general business indices

which express the trend in physical factors should be selected.

9. If physical volume is used, this will necessitate a study of price levels. Determinations must be made for the effect on price levels of such factors as technological advancements, switches from higher to lower priced units, or vice versa.
10. Although the attempt to establish connection between business condition and sales may produce better results when applied to staple lines or services, its application to specialties will generally be more satisfactory than the "guesstimating" method more commonly in use today.
11. One final point, which could well justify the whole analytical program, is the value of the base data for measuring the company's sales performance. If the company's sales are falling behind general business activity, this fact is soon revealed in the comparative data developed and the necessity for corrective action is indicated at once.

Paying Attention to Sales Potentials

The accountant must get the market facts if he hopes to be of service to his sales executive. Too much emphasis cannot be placed upon the importance of obtaining market information for the sales executive. Detailed study of dozens of sales promotion campaigns indicate that at least seventy-five per cent of those which failed did so because they were founded upon guesswork rather than upon sound fact. As one sales executive said, "I hate figures, but I never make a decision without them." Still another said, "Get the facts, or the facts will get you!"

What are the available markets for the industry as a whole? What are the markets in particular areas and with particular classes of customers? What proportion of these markets should the company secure? These are but a few of the questions the sales executive will want answered in his quest for statistical information to aid him in developing his sales program. Many concerns do not have a clear understanding of the market potential of their products or prospective products. They are expending much ammunition without having determined their targets. As a matter of record, each year seems to find the ammunition more expensive and the targets more elusive.

There is no one method of market analysis which applies to all types of business. Factually, there are as many types of market analyses as there are marketing problems. The method must be largely adapted to the individual company. However, the objectives are the same in all business, namely, to determine the location, the purchasing power, the buying methods, and the likes and dislikes of present and prospective customers.

The field of market research and analysis is one which offers the analyst one of his greatest opportunities to make a real contribution toward profit planning. However, the detailed methods and procedures are too ramified to attempt to consider them in this paper. Nevertheless great emphasis must be placed upon

the importance of obtaining and using market information as an integral part of planning a sales program.

MARKETING COST CONTROL

Now that the factors affecting sales volume have been touched upon and a study of our market potentials recommended, we will turn our attention to a development of the techniques of controlling marketing costs.

Three Important Preliminary Considerations

We do well to stay a moment with the question of what marketing cost control is. First, I would like to make a distinction between the phrases "marketing costs" and "distribution costs." For our purpose, we shall consider marketing costs as the ones for which the sales executive is most commonly responsible. They are:

1. **Advertising and sales promotional costs —all expenditures for advertising, sales promotion, general publicity, customer education, and market development.**
2. **Direct selling costs—all direct expenses of salesmen, sales offices, sales supervision, and allied services.**
3. **Cash discounts allowed on sales.**

To complete the distinction, it should be pointed out here that the remaining distribution costs are:

4. **Transportation costs—all costs of packing; outbound freight, express, or trucking, inbound freight on returned merchandise, and a portion of the traffic department expense.**
5. **Warehousing, storing, and handling costs —Cost of warehousing, storing, and handling finished goods.**
6. **Credit and collection costs—all expenses in connection with a credit department, collection costs, and losses from bad debts.**
7. **General and administrative costs—the cost of accounting for distribution activities, market research, and a portion of the general administrative cost.**

In wholesaling and retailing concerns where the purchasing function is closely allied with selling, purchasing expense may be included with distribution costs.

The second significant point to be noted at the start is that there is a real difference between production cost control and marketing cost control. In controlling production costs, management is largely concerned with the effect of volume on unit costs. When planning marketing costs, on the other hand, management is usually concerned with the effect of costs on volume. The effect of advertising expenses on sales volume is an example. Management is much less certain of the effect of marketing expenditures on volume than it is about the effect of volume on unit production costs. Thus, the most profitable sales volume for any company is both "cause and effect" of the right amounts and

kinds of selling and promotional expenditures. It follows that the control of these costs is at once a most difficult and important problem.

The objective of controlling marketing costs is, then, to increase the effectiveness of the sales effort and thus reduce the unit costs. Those businesses which have successfully achieved substantial reductions in their unit marketing costs have done so through the application of two basic principles:

1. Intelligent direction of the sales effort.
2. Establishment of standards by which to measure and control the cost and effectiveness of that effort.

The problems are to decide how much to spend, what type of expenditures to make, and when to make them in order to produce predetermined sales results—also to see that such expenditures are made as planned and that they produce the desired results.

The third and not least meaningful of our preliminary considerations is that the sales program and marketing costs are interrelated and interdependent. The objective is to secure the combination of elements of selling effort which will, in the long run, produce the most profit. Almost any sales volume can be secured if enough selling effort eventually reaches a point where the additional sales produced do not compensate for the additional effort. Conversely, the selling cost can be reduced to almost any point desired but with the ultimate effect that sales volume will be reduced so low that no profit will result. Somewhere between such extremes must be found the proper amount of sales effort to be used. This principle applies not only to sales volume as a whole, but also to individual classes of products, individual territories, and individual customer groups.

Thus, neither the sales program nor the marketing cost program can be developed independently of each other. Moreover, a coordination must be effected with the production and finance programs. The selling effort must be of a type designed to sell products which can be profitably produced, particularly those in which the concern holds a competitive advantage. Furthermore, the program of selling effort must not exceed that which can be safely financed.

Marketing Cost Standards Are Needed

It is simple and true to say that the marketing effort should be directed in accordance with the market possibilities. This is one of the most important reasons for analyzing the market potentials. Many concerns upon correlating their marketing effort with the potentials of their markets have found astonishing discrepancies. By intelligent redistribution the profitability of the effort has

been greatly increased. For example, if there are 1,000 potential buyers in Territory A and 2,000 in Territory B, it would seem logical, other conditions being equal, to direct twice as much effort to Territory B as to Territory A. However, this plain underlying concept is just a starting point. It leads on to complications which require the development of performance standards.

Although standards of performance have become almost universal in their application to the efficient control of production costs, we are, by and large, in the embryonic stage in the development of standards as applied to marketing costs. It would be folly to contend that all marketing activities can be highly standardized, but it would be equally foolish to assume that the task is hopeless with respect to them all. Neverthless, it is to be remembered that, in developing the marketing cost standard and eventually controlling the actual cost, our desire is to maintain proper relationship of effort, cost, and results. Not only must the various marketing functions be performed at satisfactory costs but also the effort must be productive of sufficient sales volume to justify the cost.

To be most effective for cost control purposes, the standards developed should be reduced to the measurement of individual activity or performance whenever possible. It is not sufficient to know that traveling expenses on the whole are in excess of standard. It must be known which particular men are exceeding the standard. In setting the marketing cost standards, the following steps may be taken:

1. Classify the costs according to responsibility. For example, each product line may be the responsibility of a separate sales organization. It is logical, then, to consider each product line as a separate classification. United action by each unit of responsibility is what we seek. One of the primary purposes of budgeting is to determine the most profitable course through which coordinated effort will produce the desired results.
2. Select bases of measurement through which the standards can be expressed. Such bases will vary with the type of measuring which is to be done. For example, measurement may apply to effort used, to cost expended, to results achieved, or to a relationship among all three of these factors. For example, a salesman may be expected to make a given number of calls per day. This constitutes a measure of effort and the unit of measure is the call. The allowed cash discounts would be measured in terms of sales dollars. This is a measure of cost and the unit of measurement is the percentage of sales dollar. Or a salesman may be expected to produce a certain number of orders. This is a measure of results and the unit of measurement is the number of orders received. Finally, a salesman may be required to hold his direct costs within a certain percentage of his sales volume. Here the measurement is in terms of relationship of particular costs to results in sales volume and the basis of measurement is the ratio of one to the other.
3. Analyze past experience in terms of the respective classifications chosen, with a view to selecting the best results therefrom as base media for our budgetary program. These costs must be segregated into their fixed and variable components in relation to their respective base media.
4. Finally, establish standards of performance by expense account classification for each cost responsibility or function, aided and abetted, of course, by the judgment of the sales executives upon whose shoulders will fall the responsibility of obtaining satisfactory results.

To illustrate the procedure recommended, let us examine its application to two of the major cost items in the area of marketing costs,—salesmen's traveling expenses and advertising costs.

Establishing Standards: Salesmen's Traveling Expenses

Aside from the development of new territories, introduction of new products, and special promotional work as may be required from time to time, salesmen's traveling expenses should bear some standard relationship to sales volume or gross profit margins. These standards are by no means the same for all products or territories. The first step is to assign the traveling expenses to the respective territories. Next, these expenses should be broken into their component elements—such as transportation, lodging, meals, and incidentals. Then the relationship of each of these expense elements to sales volume (or preferably gross profit) can be ascertained. Finally, from this intensive cost analysis, normal or standard expectancies of performance can be established.

Obviously, salesmen's traveling expenses cannot be as accurately measured as, for instance, direct factory labor. It may often be necessary to keep a trained sales organization in the field, even though changing business conditions make it impossible to maintain relationships with the cost standards. However, one of the most important reasons for having these budget standards is to permit intelligent exceptions when unusual circumstances justify.

There is a feeling on the part of some sales executives that strict control of salesmen's traveling expenses is not conducive to the most enthusiastic effort. In my opinion, this line of judgment may well be the portrayal of a weak and inefficient sales management. A capable salesman knows what expenses are necessary to do his work efficiently and expects to be rewarded on the merits of his sales performance, rather than having to "pad" his expense account. Experience has shown that there is less dissension among sales staffs where there is a more rigid policy than one where laxity prevails.

Of course, as has been stated before, there must be a definite interrelationship between any budget allowance and the sales program, itself, as developed from the market potentials. Determinations must be made as to products to be sold, customers to be pursued or cultivated, and methods to be employed. Comparisons with past performances are not sufficient. They only tend to perpetuate any inherent weaknesses. Proper budget standards for salesmen's expenses can and should be established through scientific analysis of the local situation and the application of good, sound judgment on the part of all parties interested in effective profit control.

Establishing Standards: Advertising

Advertising expenditures represent one of the largest single areas of expense in most businesses. Although it is one of the most difficult to budget, it was one of the first cost items to be subjected to budgeting. This came primarily because of lump sum appropriations, which were erroneously called "budgets." Yet there is probably no other single item of business cost with such an inherent waste factor. This does not necessarily mean that there is too much spent for advertising but rather that there is less scientific thought given to the problem of relationships among purposes, costs, and results than to most other costs. This area thus represents a challenge to the accountant to aid in the development of proper standards.

The first step in control is a determination of the purpose of advertising. It has been rather conclusively proved that the more definitely these objectives may be determined, the more intelligently the advertising program can be planned, its results predetermined, and its cost controlled. Some of the objectives of advertising may be the following:

1. To establish new products in the market.
2. To develop new markets.
3. To meet competition.
4. To increase sales.
5. To reduce the cost of other selling effort.
6. To maintain prices.

Obviously, there are other objectives of advertising, but these are the commonest ones. Having once established our immediate objectives, our next problem is to determine the exact media to be employed in this endeavor.

Advertising expense normally divides itself into two main classifications:

1. The cost of the individual advertising program, including space cost, layout and art work, printing, mailing, and the like.
2. The cost of operating the advertising department, including the salaries and expenses of the advertising personnel.

All of the advertising costs should be resolved into individual advertising and sales promotional project costs. Each project cost should consist of its layout and art work cost, its space cost, its printing and mailing cost, and other direct costs, plus a proportionate share of the advertising department overhead expense. Cost standards should then be developed for each project. The relationship between costs and results of past performance of the individual projects should then be attempted. This, of course, will require considerable judgment, but such data will provide at least some basis for an intelligent approach to the coordination of purpose, cost and result.

There are two general methods in use in determining the amount of the advertising budget. The first plan entails making a lump-sum appropriation based

upon some such factors as a percentage of budgeted sales or gross profits. This total appropriation is then split up and applied to individual projects. The second plan entails careful examination of objectives of the advertising program, to determine the specific projects to be selected, and to estimate the cost of attaining the objectives. While it is never possible to tell exactly the amount of advertising necessary to produce a given sales volume, adequate records of past experience analyzed as to cost and results facilitate getting the best estimate.

The lump-sum appropriation plan is basically weak, in that it does not require a detailed analysis of the relationship between objectives and costs. A consistant application of this method of budgeting advertising expenditures has the tendency to establish a maximum budget rather than to determine a proper allowance. The second plan suggested is to examine carefully the objectives of the advertising program, to outline the specific methods planned for, and to estimate the cost of each element of the program. The advantages of this plan over the lump-sum appropriation plan are as follows:

1. The sales executive is on record as to what is proposed to be accomplished and at what cost.
2. Control over expenditures in terms of projects is reasonably definite.
3. Expenditures can be timed readily for cash budgeting.

The Control Problem Posed by Unprofitable Sales

One of the greatest advantages accruing from the detailed knowledge of gross profits and marketing costs by projects, customers, order-size groups, territories, etc., is in the field of controlling unprofitable sales. The control occurs primarily by converting these sales into profitable ones or by eliminating them entirely. There are a number of practical possibilities for converting loss sales into profitable transactions.

For example, one manufacturer found that 68 per cent of the total number of his accounts, bringing in only 10 per cent of his volume, were unprofitable. Most of the unprofitable customers were gradually dropped but, nevertheless, sales increased 76 per cent as a result of more effective use of selling effort. Within a period of four years, marketing expenses were reduced from 22.8 per cent to 11.5 per cent of sales and a net loss of 2.9 per cent of sales was turned into a net profit of 15 per cent. Another manufacturer changed his sales policy, which had called for 100 per cent coverage of the market. The number of stores that he sold to directly was reduced by almost one-third, but sales increased 82 per cent, marketing expenses were reduced from 31.8 per cent to 18.2 per cent, and operating profit rose from 4.7 per cent to 14.8 per cent of sales.

The problem of eliminating unprofitable sales is not always an easy one to solve. A decision to do so is far-reaching, affecting every aspect of the business. In one direction, consideration would have to be given to the effect that smaller production runs or a reduced scale of production would have upon unit manufacturing costs. In many instances, unprofitable sales can be eliminated by changing the marketing policy from one of indiscriminately covering the entire market to one of selective selling.

Outlook for Increased Benefits from Marketing Cost Control

The accomplishment of production cost analysis since Frederick Taylor's work in the 1880's have been generally conceded. Yet production specialists would be the first to admit that unit production costs are still very far from their irreducible minimum. It is (or should be) similar with marketing costs. The very large reductions in unit production costs which have been accomplished may be equaled or surpassed. In addition, by the further development and use of budgeting principles and techniques peculiarly adapted to the more difficult problems in the field of marketing costs, still greater results will be realized.

However, let us state that the planning and control of marketing costs can never be reduced entirely to a matter of principles, rules, and procedure. The alertness, foresight, inspiration, and dynamic leadership of sales executives must always be the dominant factors. Intelligent planning and detailed control of operations are, however, one of the cardinal advantages of budgeting in any field in that every person knows his task, knows when and how it is to be performed, and can apply his full effort toward its accomplishment.

THE END IN VIEW

This paper has taken up the dual or, perhaps better, combined topic of forecasting sales (accompanied by analysis that brings in the factor of gross profit from the various products) and of controlling the costs for which the sales manager is responsible. Hence, this presentation occupies a place in both the forecasting and control fields at a point, though not the only one, where they obviously border one on the other. As the industrial accountant has long served the general and production management of his company through seasoned approaches to cost control and reduction, so also he has the opportunity to serve general and sales management in their course charting, profit maximization and cost direction problems. In both cases, the service, itself, is on a high managerial level when fully and effectively performed.

Performance Yardsticks for Sales Management

by J. GREGG ROYER

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This paper describes and portrays a number of "scales" of measurement for control of the distribution function in terms of ratios of variables significant for control purposes. Costs of direct and indirect selling personnel and of warehouse operation are covered. In the procedure utilized, comparison is effected by listing together (1) the pertinent ratios for a geographic area and (2) the average, high and low values of the same ratios for the larger geographic area of which the one in question is a part.

THE EFFECTIVENESS OF COST ACCOUNTING in the manufacturing segment of industry is generally recognized. In contrast, the development of cost accounting in the field of sales and distribution has been short of satisfactory. This is true because the accounting profession has spent relatively little effort in determining what tools are required for the guidance of those responsible for the selling function. In the main, control provided has been limited to annual expense budgets built on the basis of past experience. Once established, these budgets tend to be considered as fixed allowances for the period in question. Management is rated as doing well if it does not exceed these allowances.

Not Just Lower Expense But Better Performance

This inflexible approach fails to recognize that it is sometimes sound to overrun (say) an entertainment budget if, in doing so, a major new account is acquired, that an expensive long-distance call may be paid for many times over by increased sales volume, or that an unbudgeted trip can be successful in getting a new contract. In fact, this approach leads to annoying and picayune questioning of the salesman about excess expenditures which later events prove to have been sound. Such controls are inhibiting rather than stimulating. They narrow rather than broaden sales activity, and thereby defeat their avowed purpose, which is to increase the profits of the business.

Nevertheless, in our company, as in many others, it has become increasingly evident in recent years that accountants should assist sales executives in keeping a sound relationship between expenditures for selling and distribution and the performance levels actually achieved. There is a pressing need for information

to assist sales management to make the most efficient use of distribution facilities and personnel, just as factory cost information assists factory management in improving production efficiency. Accordingly, we have instituted a program aimed at developing operating yardsticks for sales management which, in the short period during which they have been in use, have produced excellent results. Management is enthusiastic about this new approach and is following further developments with great interest.

We were helped in the carrying out of our plan by the receptive attitude of the sales department. The materials sold by this organization encounter strong competition from other manufacturers. Profit margins are normally narrow. Successful operation depends on close attention to sales volumes, to inventory turnover and to distribution costs. Accordingly, the sales management asked for a tool which would evaluate performance by district office through measuring such items as the employment of manpower relative to sales volume, operating costs, efficiency of personnel, etc.—yardsticks which would give clues to the reasons for the great variation in profitability experienced in the nineteen territories. With this request as a start, the accountants studied the situation to determine what data might be collected toward supplying this further analysis.

Distribution Setup and Personnel

To provide background for the discussion of the various reports developed under the program, there is given in this and succeeding paragraphs a brief description of the organization structure and operation of a typical sales division in our company. The Building Materials Division of the Armstrong Cork Company consists of nineteen district sales territories referred to, which cover the United States and Alaska. These districts represent the organization for the distribution of products manufactured in the various plants of the company. Activities within the nineteen district sales territories are directed from the same number of district sales offices. Some of these offices are expanded to include one to four branch sales offices. Each district sales territory is headed by a district sales manager who is responsible for the operation of the district and its branch offices. The salesmen operating from these district and branch offices are of three types:

1. *Dealer products salesmen*—selling lumber dealer and acoustical products to wholesalers and acoustical contractors.
2. *Equipment salesmen*—selling equipment insulation direct to manufacturers.
3. *Industrial insulation salesmen*—selling low and high temperature insulation materials, both on a basis of materials only and on a basis of contract sales covering the materials and their installation. Because of the nature of the contract business, two additional functions are performed in conjunction with the industrial insulation phase of this business by:

a. Construction superintendents supervising the actual contract installations and
b. Estimators assisting the salesmen in the preparation of contract proposals by performing the detailed work of estimating material and labor requirements.

Supplementing the salesmen, construction superintendents and estimators, there are clerks who handle the routine work connected with the processing of both regular and contract sales.

To facilitate the prompt delivery of materials to contract operations, the division has thirty-eight warehouses strategically located within the district sales territories. The major portion of the space in these warehouses is assigned to the storage and handling of industrial insulation materials. A small portion of space is set aside for equipment insulation materials.

Two Areas of Performance: Personnel, Warehouses

An examination of operating expenses showed that the bulk of the costs were of two kinds—expenditures related to the various types of personnel and expenditures related to the operation of the warehouses. In developing the operating cost yardsticks, we followed this division of cost categories, and decided on two major reports—one relating to personnel and the other to the warehouses. Included in the personnel yardsticks are measurements of the comparative cost and performance levels of the following types of personnel:

1. Dealer products salesmen
2. Industrial insulation salesmen
3. Equipment insulation salesmen
4. Construction superintendents
5. Estimators
6. Clerical employees

Included in the warehouse yardsticks are measurements of the comparative costs of the various warehouse locations.

The yardsticks given form in Exhibits 1 and 2 cover personnel and Exhibit 3 covers warehouse operations. These exhibits are in the form in which they are issued to sales management. Reports for each sales territory are issued to the respective district sales managers annually and, in addition, a summary report is prepared for the division sales management. With these comparative figures available, a district sales manager can readily see how his district office performance in the various categories compares with others. Areas of performance requiring improvement are clearly indicated and efforts can be directed toward this end.

All figures we develop to provide the measurements are based on experience covering a period of one year. Because of the heavy work-load at year-end, the annual period from September 1 through August 31 is used. This provides revised yardstick figures by November 1 of each year. Publication of the yard-

OPERATING COST YARDSTICKS

SALES AND CLERICAL PERSONNEL

PERIOD - 9/1/52 - 9/1/53 — OAKDALE DISTRICT SALES TERRITORY

	Salesmen (1)			Clerical Costs
	Dealer	Equipment	Industrial	
Cost per Man (Thousand Dollars)				(2)
District	8.56	11.06	7.43	1.15
Division - Average	8.69	10.44	8.77	1.43
High	9.65	12.65	12.94	2.46
Low	7.01	7.36	7.43	.81
Cost per Thousand Dollars of Sales				(3)
District	24.15	7.86	39.34	3.83
Division - Average	25.37	6.74	31.08	6.26
High	37.46	34.32	52.66	14.17
Low	13.46	3.20	14.54	3.50
Sales per Man (Thousand Dollars)				
District	356.0	284.0	189.0	
Division - Average	342.0	298.0	282.0	
High	521.0	479.0	748.0	
Low	257.0	137.0	159.0	

NOTES: (1) Costs include salaries, travel and entertainment expense, and automobile maintenance charges.

(2) Clerical costs per man represent total clerical salaries divided by the number of salesmen.

(3) Clerical costs per M dollars of total office sales.

EXHIBIT 1

sticks at that time is particularly helpful to sales management, since they are available when budgets for the following year are being prepared by the district sales managers.

Evaluating Sales and Clerical Personnel

The measurements represented by Exhibits 1 and 2 and concerning the performance of personnel are prepared for each sales territory. Included are the average performance for the district, the division average, the division high, and the division low. Employees are classified for the purpose of the various measurements in accordance with time allocation sheets which are submitted annually

by the district managers. Where an allocation sheet indicates an employee's time is spread over several types of effort, the actual costs are prorated on the same basis.

The first yardstick included in both Exhibit 1 and 2 is cost per man. This cost includes actual annual payments for salaries, travel, entertainment, and automobile expense. Salary costs for each employee are taken from earnings records and travel and entertainment costs are secured from individual expense reports submitted weekly and summarized monthly. Included in these weekly expense reports are costs of operating company-owned automobiles assigned to the salesmen. Also included are other travel costs, such as meals, hotel lodging, tips, and costs of entertaining customers. Depreciation for each automobile is obtained from property asset records.

The figures on the exhibit, applicable to salesmen represent the total of such expenses incurred, by type of personnel, divided by the number of each type personnel.

Clerical costs per man represent the total clerical salary costs in a district sales territory divided by the total number of salesmen, construction superintendents, and estimators in the district sales territory. Thus it is not the clerical cost per clerical employee but, rather, the clerical cost per sales employee (excluding clerical employees). This information is helpful in indicating where clerical costs are out of line in relation to the size of the sales force.

The second yardstick included in Exhibit 1 is cost per thousand dollars of sales. This yardstick is helpful in pointing out high cost sales operations requiring management attention. The cost elements included are the same as those listed above under cost per man. The total costs for each type of personnel are divided by the total sales of each type of personnel. This yardstick applies principally to the three types of salesmen—dealer, industrial, and equipment. The clerical costs per thousand dollars of sales represent total clerical salary costs in a district sales territory divided by the total sales of all products within the district sales territory.

The third yardstick included in Exhibit 1 is sales per man. It is obtained by dividing the total sales of each type of salesman by the number of salesmen of that type. This yardstick not only indicates the areas requiring special attention to build up sales, but also makes possible an evaluation of performance by individuals. Since one of the most important responsibilities of the district manager is to develop salesmen, this guide has been most welcome. Through it he learns the weaknesses and the strengths of his personnel and can make intelligent corrections.

OPERATING COST YARDSTICKS

ESTIMATING AND INSTALLATION PERSONNEL

PERIOD - 9/1/52 - 9/1/53 OAKDALE DISTRICT SALES TERRITORY

	Constr. Supt.	Estimator
Cost per Man (Thousand Dollars)		
Office	8.96	5.80
Division - Average	8.16	4.61
High	9.14	5.80
Low	6.65	3.61
Cost of Estimator per Thousand Dollars of Contract Sales		
Office		12.32
Division - Average		9.89
High		30.40
Low		3.63
Cost of Supervision per Thousand Dollars of Contract Labor		
Office	44.50	
Division - Average	40.95	
High	117.55	
Low	21.02	
Contract Labor (Thousand Dollars) per Constr. Supt.		
Office	201.0	
Division - Average	199.0	
High	334.0	
Low	68.0	
Incidental Contract Cost per Thousand Dollars of Contract Labor		
Office		106.55
Division - Average		103.29
High		206.19
Low		54.93

EXHIBIT 2

Evaluation of Estimating and Construction Personnel

The first two yardsticks in Exhibit 2 are the same as the corresponding ones in Exhibit 1. With respect to the second of these yardsticks, since construction superintendents are concerned with the supervision of construction of contract installations rather than the securing of the actual contract sales, the cost per thousand dollars of sales is not applicable to this type of employee. The estimator's cost per thousand dollars of sales is based on contract sales only, since

work performed by this type of employee is solely in connection with the securing of contract sales.

The third yardstick included in Exhibit 2 is cost of supervision per thousand dollars of contract labor. This yardstick applies only to construction superintendents. Cost includes actual payments for salaries, travel entertainment, and automobile expense. The total of such expenses incurred in each district sales territory by the construction superintendents is divided by the total actual contract labor payments made in the district sales territory. Contract labor payments were selected as the base for measuring construction superintendents' costs because labor costs are the major element over which the construction superintendents exercise supervision and control.

The fourth yardstick included in Exhibit 2 is contract labor per construction superintendent. Contract labor payments in each territory are divided by the total number of construction superintendents in the territory to obtain the figures for this yardstick. This information is helpful in indicating where additional contract volume is required to justify the services provided by a construction superintendent.

The final yardstick included in Exhibit 2 is incidental contract costs per thousand dollars of contract labor. In addition to the costs incurred by construction superintendents in each territory, (as listed under cost per thousand dollars of contract labor), substantial amounts are also expended in connection with the contract work, which cannot be readily charged directly against the contracts. These costs include such items as insurance premiums on contract floater policies, depreciation on contract, loose equipment and tools, payroll taxes on contract labor, occupational sickness and injury payments, company expenses for employee benefits like retirement insurance, group life insurance, and hospitalization. These expenses are charged to a contract expense account by district office and included with the monthly expense reports for the various district sales territories. The total of these expenses by territory is divided by the total contract labor payments by territory to secure the figures for this yardstick. It indicates the ratio of these indirect expenses to contract labor activity and is useful when contract bids and estimates are being prepared.

Evaluation of Warehouse Operations

The function of warehouses maintained in district sales territories is two-fold. First, it permits rapid servicing of drop or less than carload orders and, second, it makes possible savings in freight on the materials which otherwise would have to be shipped by less than carload freight. However, efficient operation

OPERATING COST YARDSTICKS

WAREHOUSE

PERIOD - 9/1/52 - 9/1/53 **OAKDALE DISTRICT SALES TERRITORY**

DATA				Oakdale	Elmwood	Ashville
Labor				3,415	3,963	454
Rent				3,131	4,797	876
Space Used				9,020	10,187	3,878
Inventory Value - Monthly Average				27,368	47,904	13,117
Warehouse Shipments (Net)				58,625	107,022	26,885
	DIVISION					
	High	Low	Ave.			
Labor - per Thousand Dollars of Shipments (Net)	120.15	2.06	46.43	58.25	37.03	16.89
Rent						
Per Thousand Dollars of Shipments (Net)	202.31	4.94	40.03	53.41	44.82	32.58
Per Square Foot per Year	1.03	0.12	0.40	0.35	0.47	0.23
Space Utilization - Sq. Ft.						
Per Thousand Dollars of Shipments (Net)	222.0	22.0	100.0	154.0	95.0	144.0
Per Thousand Dollars of Inventory	458.0	76.0	258.0	330.0	213.0	296.0
Ratio of Returns to Gross Shipments	36.7	1.2	13.2	11.7	13.8	11.9
Inventory Turnover	5.5	1.5	3.2	2.1	2.2	2.0
Ratio of Inventory to Net Sales	8.7	1.8	4.7	5.9		

EXHIBIT 3

of warehousing is a must if profits are to be improved through the addition of this service to the customer. Close attention to the trends uncovered by analysis will point up excessive costs resulting from low turnover of inventory, excess capacity as determined by space utilization, inefficient labor, or above normal rents. To assist in avoiding these pitfalls, the yardsticks shown in Exhibit 3 have been developed. These yardsticks are prepared for each district sales territory. Included in the report are figures for each warehouse located within the district sales territory, as well as the division average, the division high, and the division low.

The upper section of the report lists the data used to develop the individual

yardsticks. Labor and rent figures represent payments made, and were selected because they account for over ninety per cent of the warehouse operating costs. These figures are obtained from monthly operating reports which compare actual expenditures with budgeted allowances. Space used indicates the amount of warehouse space occupied. These figures are available from allocation drawings which are maintained by the division manager's office. Average monthly inventory values and net warehouse shipments are summarized from records kept by the inventory control section of the accounting department.

Three of the warehouse yardsticks are based on dollar value of net warehouse shipments. These three are labor cost, rent cost, and space utilization. The ratios developed in these three yardsticks point out warehouse locations where these major elements of operation are out of line in relation to the volume of warehouse shipments, and corrective steps can then be taken.

In developing the yardstick, rent—per square foot per year, total annual payments for warehouse rent are divided by the amount of warehouse space occupied. The comparative figures thus developed readily indicate where rental rates are too high and an effort can then be made to locate less expensive rental properties as future leases are negotiated.

The amount of space occupied is divided by the average monthly inventory to secure the figures for the yardstick, space utilization square feet per thousand dollars of inventory. This yardstick provides a measure of the relative efficiency of space utilization at the various warehouse locations. A high space utilization figure indicates a need for improved inventory storage.

Returns of materials from contract sites result from overshipments or from overestimating the requirements. Such returns mean higher warehousing costs, since there is duplicate handling as well as a possibility of damage to materials. The ratio of returns to gross shipments is developed by dividing the returns by the gross warehouse shipments. This measure indicates another aspect of the efficiency of the warehouse functions. The higher the ratio, the lower the efficiency, indicating a need for improved estimating of contract material requirements and scheduling of shipments.

Inventory turnover is developed by dividing the average monthly inventory into the cost value of the net warehouse shipments. The higher the turnover rate, the more efficient the operation, resulting in a better return on the capital invested in the form of inventories.

The ratio of the inventory to net sales reflects the relationship of total average monthly warehouse inventories within a district sales territory to total industrial insulation sales within the same district sales territory. The total industrial

insulation sales include shipments direct from factory to customer and shipments from warehouse to customer. A low ratio is more desirable than a high one in this category, since it indicates a greater proportion of shipments direct from factory to customer. This is desirable, as it shows the salesman is working with the customer to consolidate his orders on a carload basis, whenever feasible, and to limit his reliance on the warehouse stocks for fill-in purposes only.

Indications of Needed Action

The development of these yardsticks for distribution costs has provided sales management with relative performance data which has assisted in attaining a high degree of operating efficiency from sales and construction personnel and in the use of the distribution facilities. When the reports covering a particular annual period are studied along with those of previous annual reports, trends are observed which are indicative of the steps required to improve future operations. In the short time during which we have had the system in operation, it has been found that this information is most beneficial in the continuing endeavor to achieve an adequate profit in relation to sales volume and capital invested.

Flexing the Flexible Budget Before—Not After

by JOHN P. MURRAY

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The theme of this paper is that the flexible budget expense allowance for a given accounting period may be determined and the expense reduced to the requisite level before the beginning of the period. This requires responsibility accounting and responsibility reports, simplified budgeting, full participation and indoctrination of all concerned, as well as thorough follow-up procedures. Conditions in the case study narrated required that most expense items be considered one-hundred per cent variable as a temporary expedient.

IN THE MANAGEMENT of any manufacturing operation, large or small, it is necessary to have current facts about the performance of the organization against its plans, budgets and standards. Without this knowledge, management must act on guesswork, without factual foundation for its decisions. Managements of our industrial concerns recognize the need for current facts about the performance of each major unit of the business. Proper decisions for guiding the business are arrived at by knowing what conditions affect the operation, their relative importance, and the most effective ways of coping with them.

A major manufacturing unit consists of many smaller ones. Each of the smaller units is under the management of an individual who has been assigned the responsibility of operating his unit effectively. He must have the same knowledge of his unit of the business as top management has of the complete organization. This is true of all factory operating supervision—managers, superintendents, general foremen and foremen alike. They must plan, place the plan in operation, and measure the performance of their section or unit of the business against the plan. They must put the most important decisions first, yet give proper attention to those of lesser importance, and anticipate the effect of current operating conditions on future results. In other words, they have substantially the same problems of management as the head of the business.

The Problem

An analysis of our indirect manufacturing expenses disclosed that in prior years there were parts of this component of our costs which were out of line and were contributing heavily to high costs that reduced the profitability of our operation, and that the unfavorable trend of these costs was continuing. In

view of this it was obvious that a new approach was required, to bring this component of our costs under control. This new approach involved refinement of our budgeting procedure. The usefulness of flexible or variable budgets in expense control is generally acknowledged. A variable budget, in one form or another, has been used for more than twenty years in our organization. It is thus not the intent to go over here the principles of variable budgets. Rather it is to suggest an approach, involving alterations in the existing budgetary system, that has been tried and proven successful in lowering expense levels.

It is not uncommon practice to use total direct labor hours or dollars as the activity base to which a variable budget expense allowance is related. Total direct labor hours or dollars include both standard and nonstandard labor. This was our practice in the use of variable budgets for a number of years, although it was recognized that, with such a base, direct labor inefficiencies increased the budget allowances. The segregation of expenses into fully variable, semivariable, and fully fixed categories is also usual practice with respect to variable budgets. The semivariable expenses represent those categories of expense, such as supervision, which are considered to contain an irreducible minimum of expense required to remain on a "ready to serve" basis of operation. On both these scores, during a period when the emphasis is on all-out production, the likelihood is that inefficiencies will become embedded in variable budget allowances. Not only will allowance for the categories of expense treated as one-hundred per cent variable with volume become greater, but the fixed portion of the semivariable expenses will increase in magnitude. Concurrently, the break-even point of the business is increased because expenses are controlled in terms of an inflated standard of performance.

At the time the review of our practice was made, variable budget allowances were related to actual total direct labor dollars, which included rework and other extra cost variances. The variable budget allowance consisted of fixed dollars of expense per week, regardless of activity rate for semivariable expense categories and fixed charges and per cent of total direct labor budget allowances for categories of expense considered fully or semivariable with volume of activity. Budgeting by accountability at foreman or section supervisor level was limited to a fraction of the expenses for which they were accountable. Participation of foremen and section supervisors in the budgetary program was meager.

Before we go into our revised procedure, it might be observed that the setting up of a variable budget will not in itself keep expenses under control. It can only serve as a tool for the use of responsible foremen, supervisors, or

managers in controlling expenses at acceptable levels of performance under varying volumes of activity. Action on the part of a foreman is required to bring expenses down when reductions in production activity occur. Action on the part of a foreman can also bring down the level of expenses at a constant rate of production activity, or even in the face of increased production activity. This being so, budgeting and reporting by responsibility or accountability become essential to success in the budgetary control of manufacturing expenses. There is another pertinent circumstance relevant to our need for more effective budgeting. Experience indicated we were usually faced with violent fluctuations during the year in our direct labor loads, which was our budget control base, due to the seasonal type of our business, inadequate sales forecasts and consequent frequent changes made necessary in our production schedules. When a change in volume occurred, the manufacturing plants under the then existing variable budget system, were slow in reducing their controllable costs in line with downward revisions in production volume.

The Solution

The approach used to obtain rapid reductions in expense levels consisted principally in applying the following concepts:

1. Strict accountability by responsibility, down to the lowest echelons of factory management.
2. A simplified version of variable budgeting.
3. Full participation of all foremen, supervisors and managers in the preparation of budgets.
4. Indoctrination in budgetary control for all management personnel, through meetings and individual counseling.
5. Budget performance reports by accountability.
6. Determined and exhaustive follow-up, investigation and corrective action on budget deviations.

Basically, the weakness of our previous system rested in too much centralization of responsibility for the preparation of budgets and for the control of expenses against the budgets so established. It is difficult to obtain the full interest and cooperation of a foreman in living within a budget prepared without his full participation and concurrence. Confidence in the budget goal comes from a full knowledge that can only be obtained through living with its preparation and knowing in advance how the budget objectives are to be met. Further, full participation and concurrence in the establishment of the budget goal permits of no shrinking from responsibility on the grounds that the budget is unrealistic or incorrect. Centralization in a superintendent or general foreman of the responsibility for control of expenses of several foremen, which results when they have not fully participated in the budget, takes the foremen off

MANUFACTURING BUDGET PERFORMANCE REPORT

Plant _____ Week Ending _____

Cost Center _____ Supervisor _____

Direct Labor

	Current week			Year to date		weeks
	Actual	Budget	PR	Actual	Budget	PR
Total direct labor						
Less: unapplied labor						
design changes						
planning changes						
Standard direct labor						

Controllable Indirect Manufacturing Expenses

		Current week			Year to date		weeks
		Actual	Budget	PR	Actual	Budget	PR
611.	-Supervision						
612.	-Inspection						
614.	-Clerical						
615.000	-Service total						
621.	-Overtime, night shift bonus						
623.628	-Employee benefits(incl.vac.&oth.hours)						
641.100.							
	-Non-durable tools						
.200	-Shop and office supplies						
.400	-Manufacturing supplies						
642.	-Utilities						
643.	-Maintenance						
644.	-Rearrangement						
645.100	-Spoilage						
.200	-Material quality						
.300	-Inventory losses						
.400	-Scrap credits						
	Total unapplied material						
646.100	-Make-up payments						
.200	-Idle time payments						
.300	-Training time						
.400	-Rework						
.500	-Rate variance						
.600	-Re-use						
.700	-Wage adjustment variance						
.800	-Miscellaneous plating, etc.						
.900	-Other extra cost						
	Total unapplied labor						
648.	Total misc. controllable expense						
650.	-Expense credits						
	Total controllable expense						

PR- Percent realization of budget

Number of Employees Drawing Pay

	This week	Last week
Hourly- direct		
- indirect		
Salaried		
Total		

EXHIBIT 1

the management team and removes control from the point of expenditure. We made certain that such a situation would not exist. To obtain a point of departure in the control of expenses it was thus necessary to break down the complete indirect expenses of the several manufacturing plants by responsibility pattern, to individual foremen and supervisors, so that a logical pattern of control by accountability could be established.

Prior to this time it had been our practice to make assessments on various bases of distribution, between plants and to plants, representing a complex

system of prorations and reprorations, or allocations and reallocations. This practice, although perhaps essential from the standpoint of full cost determinations, obscured accountability for results. It placed in the foreman's, supervisor's, or manager's report expenditures for which he was not directly responsible and over which he could not exercise control. Consequently, a major requisite of control by accountability was attained by simply abolishing cross assessments from our bookkeeping and expense control reports, resorting instead to periodic statistical, nonbook, full cost determinations.

It likewise appeared to us that the variable budget practices then in use were too complex for ease of understanding and application by the many supervisors and foremen who would, for the first time, fully participate in the program by preparing and living within their own expense budgets. In addition, looseness in budget allowances which had developed might be perpetuated. It was desired to install a basis which would emphasize the need for drastic expense reductions concurrently with reductions in production activity and which would eliminate inflated allowances. As a temporary expedient, it was decided to treat all indirect manufacturing expenses except depreciation, taxes, insurance and rentals as one-hundred per cent variable with volume. The activity measure was changed from total direct labor, which included setups and rework and other extra labor costs, to a standard direct labor base which excluded standard allowances for setups and rework and other extra labor costs. Direct material and labor inefficiencies, waste, and setups, for which percentage allowances had previously been provided in determining direct material and direct labor cost standards, were treated as items of controllable indirect manufacturing expense and budgeted accordingly.

It was of course recognized that a one-hundred per cent variable budget would only provide a proper budget allowance at the normal level of activity on which it was based. At below normal activity levels, required reductions in expenses to meet budget allowance would be sharpened. At levels above normal activity, on the other hand, there would be a too liberal budget allowance for expenses. As our first below-normal levels of activity occurred in the first three months of the year and re-appeared at the end of the year, the granting of a too liberal budget allowance during the above-normal activity levels, did not appear to be a dangerous course of action. The early below-normal activity level would introduce the need for expense level reductions which would carry forward into the periods of high activity.

Expense control reports for foremen and supervisors were redesigned to suit the new expense control concept. The principal dollars reports were a weekly

MANUFACTURING BUDGET PERFORMANCE REPORT

Plant _____ Month Ending _____

Cost Center _____ Supervisor _____

Direct Labor

	Current month		weeks		Year to date		weeks	
	Actual	Budget	PR	AR	Actual	Budget	PR	AR
Total direct labor								
Less: unapplied labor								
design changes								
planning changes								
Standard direct labor								

Indirect Manufacturing Expenses

Expense classification	Current month		weeks		Year to date		weeks	
	Actual	Budget	PR	AR	Actual	Budget	PR	AR
611.100-General supervision								
611.200-Foremen salaried								
611.300-Hourly leaders								
Supervision total								
612.000 Inspection total								
614.100-Production clerks								
614.200-Purchasing clerks								
614.300-Manufacturing methods								
Service - total								
621.110-Overtime allowance-direct								
621.120- " " -indirect hrly.								
621.130 " " -salaried								
621.200 Night shift bonus								
623.000- Vac.,mil.& jury duty total								
630.100-Continuity of service								
630.200-Social security taxes								
630.300-Stock bonus plan								
630.911-919-Other employee benefits								
Employee benefits total								
641.100-Non-durable tools								
641.200-Shop supplies								
645.100-Spoilage								
645.200-Material quality								
645.300-Inventory losses								
645.400-Scrap credits								
Unapplied material total								
646.100-Make-up payments								
646.200-Idle-time payments								
646.300-Training time								
646.400-Rework								
646.500-P								
660.200-Taxes								
660.300-Insurance								
660.400-Depreciation								
Fixed expenses total								
Total manufacturing exp.								

PR- Percent realization of budget

AR- Actual percent to standard direct labor

EXHIBIT 2

Manufacturing Budget Performance Report, which provided a condensed summary for each foreman, and a more detailed monthly summary, illustrated here by Exhibits 1 and 2, respectively.

There were several accounts, formerly a part of the direct costs, which it was decided, for control purposes, to move into the indirect manufacturing

expense structure. Examples were spoilage, training, rework, setups and inventory losses. From this it was felt a more comprehensive picture of the cost of manufacture and deviations from standard or budget could be obtained, as these costs would appear on the operating statement and individual indirect manufacturing expense reports by accountability, as a part of one total. It is believed this is a very desirable feature.

Emphasis on Participation

As a result of the need for further education of foremen and other supervisory personnel in the compilation and operation of expense and cost control budgets, a manual was prepared which could be used for both educational and reference purposes. This manual includes the basic information required by foremen and supervisors in the construction of their budgets and also serves as a reference book for them through which they can gain a better understanding of the cost and expense control data being supplied to them.

Prior to the time that it was necessary to start the compilation of the annual indirect manufacturing expense budgets, instructional meetings were held for the supervisors and foremen who were to budget their expenses in detail for the ensuing year. The routines and procedures for the proper compilation of indirect manufacturing expense budgets and use of the budgets in cost and expense control, were exhaustively reviewed. Principle subjects discussed at these meetings are suggested by the topical outline that follows:

1. What is a budget?
2. The necessity for uniform practice in budget preparation.
3. Reasons for the compilation and use of budgets.
4. What the elements of cost are, how they are defined, and how they are determined.
5. The classification of indirect manufacturing expenses, definition of the accounts, reasons for having these accounts, and their proper use.
6. Review of the forms to be used in the compilation of the annual budgets.
7. Explanation of the cost and expense control reports currently being supplied, and how they can be used as aids to the foremen and other supervisors in controlling and reducing costs.
8. Construction of a complete budget, account by account, for a hypothetical manufacturing cost center.

A complete discussion of each of the topics assured that the foremen and supervisors would have a detailed and intimate knowledge of the various phases of budget preparation, and their use as aids to cost and expense control. In the construction of a complete budget for a hypothetical manufacturing cost center, we went into the determination of factory load, the number of direct and indirect employees required, indirect materials and services required, and the calculation of the variable budget allowances. We taught the foremen

how a production schedule is prepared and how direct labor loads are calculated from the production schedules. We taught them how to investigate variations from budget and how to attack the problem of keeping expenditures in line with those allowed by the budget. The emphasis here was on meeting budget goals by prior planning for their realization and acting before instead of after a change in the level of production activity occurred.

After the instructional meetings, individual counseling and aid were given to foremen in the preparation of their budgets. This also provided an opportunity to check the adequacy of our instructional meetings and answer any questions that had arisen subsequent to the meetings.

The Result—Action Before Instead of After

The finally-approved expense control budgets for the ensuing year were available in November. They called, as anticipated, for reduced levels of expense which the foremen themselves had said they could attain. To let the foremen see the reductions from existing levels of expense that would be required as of the first of the new year and get action for reductions under way, weekly and monthly budget performance reports during November and December compared actual expenses with production activity, so that the foremen were prepared to meet budget expense goals from the first day of the new year.

During the budget year we carefully analyzed the results accomplished by our budget program. Each plant manager was assigned the full time services of a cost analyst and auditor, who investigated deviations from budget, prepared analyses, and provided any supplementary data needed by the manager and his foremen and supervisors for guidance in taking corrective action.

No budget program will be fully successful unless it reaches from the top down to the lowest echelons of management, with all actively interested and participating in preparing and meeting budget goals. The program on which we embarked was successful in securing that interest and participation. Moreover, the work of refining any budgeting technique and educating personnel in the compilation and use of budgets calls for a tremendous amount of effort and hard work over an extended period of time. There is not a budgeting technique yet devised which will operate successfully unless the data is intelligently compiled and forcefully and objectively followed.

All annual indirect manufacturing expense budgets for the various manufacturing cost centers are now compiled in detail by the foremen and supervisors. We make it an important point not to make any changes in a budget without the full knowledge of the supervisor and his concurrence that the rec-

ommended change is reasonable and can be met. In other words, all budget work has been done with the full cooperation of those people whose performance will be gauged by the results shown. From the methods we have used in compiling our indirect manufacturing expense budgets, there has been developed throughout the manufacturing organization a high degree of cost consciousness, which most certainly has proven of benefit in the control of costs and expenses.

The one-hundred per cent variable approach, around which we built our present organization of the budget activity, has now given way partially to a return to recognition of semivariable costs. However, we did not return to a more complex basis for budget allowances until expense levels had been reduced and full indoctrination of all supervisory personnel in budgetary control had been accomplished.

Whatever success we have so far had in budgetary and cost control work is due primarily to two causes—

1. the education of the personnel of the manufacturing sections in the use of budgets, control reports and cost data and their cooperation in carrying out the spirit of the plan, and,

2. the interest top management has displayed in the budget and cost control work of the rank and file of factory supervision.

Budgeting Is the Road to Cost Reduction

by FRANK Z. OLES

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This paper outlines the nature of budgetary control, and the prerequisites for the establishment of effective budgetary control. It then discusses the cost reduction aspect, noting the specific areas in which cost reduction may be achieved. In conclusion, the advantages of budgetary control, each of which adds its share to cost reduction, are summarized.

THIS PAPER, WHICH IS CONCERNED about budgetary control as a means to a particular end, attempts to bring out in concise form many of the fundamentals required to effect cost reduction through budgetary control. Budgetary control is a tool of management, used to plan, carry out and control all business operations. It establishes predetermined goals and provides the bases for measuring performance against these goals. It enables a business to determine the need for modifications of its plans, without waiting for financial statements. Viewed in this manner, it embraces all other control plans and bears the same relation to them which a master budget bears to the various individual budgets. It sets the stage and provides the tools for cost reduction.

Further, budgetary control tends to iron out organizational problems. A frequent cause of failure to make profits is the lack of co-ordination of the various activities of a business. There is a constant tendency for one department, which may be headed by an aggressive personality, to dominate company activities to the detriment of the functioning of other departments. Such personalities are usually engaged in attempting to make their own place in the sun without regard to the effect of their ambition on the success of a business. Budgetary control, administered by a budget director and supported by the president, serves as an effective leveler of personalities and relegates each executive's influence to its proper place. The position of any one executive and the scope of his authority are not left to chance, but are fixed before a wheel turns. Under this plan each executive must exert his best effort to pull his own end of the program into line and has little time to worry about his associates.

Serviceable Comparisons Require Standards

We may properly spend a little time considering the need for budgetary data, especially apparent in its absence. Of course, every business, regardless of

whether it is using budgetary control or not, makes some attempt to compare current results with either budgets or the records of the prior period. Where budgetary control has not been installed, the only comparative figures available are those showing the results of prior years' operations. This type of comparison is better than no comparison at all, but that is about all that can be said for the practice, for prior year figures are based upon both internal and external conditions which may have existed during the prior period but which, in all probability, do not exist at the time the current year's figures are compiled. This is to say that many elements of prior year figures are the result of conditions which have changed. Companies (suppliers, customers, competitors) go out of business, accounts switch from one salesman to another, prices and products are changed. In short, nearly every conceivable type of revision in circumstances may occur.

To go at the point systematically, it may be said that there are three outstanding arguments against simple comparison of present with past. First, a comparison with totals made up of details which have altered is a poor comparison. This is merely another way of saying that the comparison upon which so many executives place great stress is of no real value, since it deals with an entirely different set of conditions. Second, prior year figures may be difficult to compile in accordance with the current classifications used for accounting. If any semblance of similarity of basic data is to exist, an attempt must be made to reclassify prior figures, taking into consideration not only changes which have occurred but the rearrangement of data required to meet present conditions. Third, prior year records of performance may never have represented satisfactory performance. There is nothing in prior year figures, as such, to indicate that they are worth using as a standard of comparison. These standards must be independently constructed and neither budgetary control nor cost reduction can be effectively secured without them.

Review the Chart of Accounts and the Reports Issued

Budgetary control demands, for its smooth operation, the preparation of a classification of accounts providing for the grouping of information in accordance with the data required for the preparation of management reports. Many charts of accounts have been developed as a result of a gradual growth and do not provide any semblance of an orderly arrangement nor take into consideration the amount of work involved in reclassifying the data in order to convert it into the classification required for management reports. An effectively

designed chart of accounts adjusted to the needs of a particular business will enable the general accounting department to assemble the facts pertaining to that business, not only with facility but, at the same time, in a manner which will reveal the transactions in their true light.

The history of an inadequate account classification usually indicates the causes. When the chart of accounts was originally prepared, it perhaps did fit the needs of the company. More than likely it is equally true that as the company grew and expanded its operation, either through the acquisition of additional facilities or through the introduction of better methods of record keeping, additions were made to the chart of accounts until it has become scarcely intelligible and bears little resemblance to the original. It can happen that these changes are so numerous as to make it necessary to refer the various documents of original entry to a supervisory accountant to determine the account classification, to which it applies. However naturally such a situation has developed, the use of such a chart of accounts would obviously prove unsatisfactory insofar as budgetary control is concerned. Such a chart is cumbersome and costly to operate as well as a constant source of error. It needs to be modernized and re-designed to incorporate a method of classification of accounting information based on modern principles of management and directly keyed to the management reports to be prepared through its use.

Further, in some companies, the reports, themselves, serve no good purpose in many instances, except to satisfy the curiosity of some individuals who, months or years before, originated them. Frequently, columns on the reports are prepared regularly, involving considerable clerical labor, when no one can point to any specific reason for the data. The number of reports prepared in many companies continues to increase without reference to any over-all plan until business drops off. Then, again, without rhyme or reason, reports are eliminated to save expense, frequently resulting in denying to executives the data which would enable them to save many times the cost of preparing the report. This cycle exists because the reporting structure is improperly planned or not planned at all. If set up on a sound basis, including only those reports which are justified, the reports would be needed as much in times of a drop in business as they are when business is at favorable level.

The management reports required at all times are those which serve two fundamental purposes. The first of these purposes is to furnish policy-making executives with the data necessary to enable them properly to formulate the policies for the operations under their jurisdiction or furnish department heads (below the policy-making level) with the data enabling them to run their de-

partments. The second is to supply executives data enabling them to determine whether they have achieved satisfactory performance, by measuring results obtained. Both the executive in charge of a division or department and the executive to whom he reports need a basis for measuring accomplishment. That basis of measurement must be known and understood by both the executive whose activities are being measured and the executive to whom he reports.

We are now in a position to direct our attention to the budget as a means to cost reduction. In discussing budgets we must recognize that they are basically accounting techniques designed to control costs through people. As such, their impact is felt by everyone in the organization. They are continuously being brought into the picture when anyone is trying to determine, plan, and implement an organizational policy or practice. Moreover, budgets frequently serve as a basis for rewarding and penalizing those in the organization. Since generally the budgets for selling, advertising, administrative and general expense may be easily pin-pointed for good or bad performance and are readily controllable since they individually are composed of a nominal number of cost elements, this paper will focus primarily on manufacturing budgets.

Maximum cost reduction through budgetary control is best achieved by considering a number of significant points. As to labor, it may be first said that the importance of standards in all departments of the company for control of plant operations cannot be too strongly emphasized for they are the controlling tool measuring the performance of each individual department. In fact the most important factor in the manufacturing cycle is labor. Labor is composed of human beings who, for the greater part, are interested in being treated and considered as free individuals. When management and men in a plant share mutual respect and interest in operating it economically, the major step for effecting budgetary control has been taken. Hence, sharing any savings made in the plant resulting from the use of materials and services over which the men have partial or complete control is an excellent way to instill mutual interest. In this direction, the intangible assets of an incentive pay plan, if soundly administered, will be found in the increased tempo that will come to prevail in matters of scheduling, reducing machine failure to a minimum and creating the element of cooperation in formerly none-too-willing employees. An impartial survey by a large insurance company reveals that, over a twenty-year period, incentive-inspired production has been 2.3 times the production per hour attained by day work production on comparable operations. Many modern plants are operating at approximately sixty per cent or less of the production that could be attained by properly administered incentive pay plans.

Reducing Overhead Costs by Standardization, Etc.

With the standardization of labor, should also go a complete analysis of overhead costs. Lower overhead expenditures per unit should be in line with reductions in manufacturing expense. Overhead reductions will involve a complete analysis of the organization as to function performed by every individual on the overhead payroll. It will also require a complete and impartial analysis of the functions actually needed in the planned functional organization. After the overhead departments have been analyzed and operations simplified to the most economical degree, it will be necessary to establish standards of operation in the same manner as standards were established in the manufacturing departments. This overhead control is brought about by standards in which each of the various account cost groups is budgeted in terms of the production factor to which it is most closely related if production influences the overhead expenditure, or in accordance with maximum allowances in the case of costs not so influenced.

Developed currently with reorganization study, should be an analysis of the flow of paperwork throughout the plant. Paperwork costs money. Each form should be scrutinized carefully by noting its functions, hours to prepare, cost in terms of production units, use actually made of the form, final disposition, and possible simplification or elimination of the form entirely. A flow chart of each form will often reveal possibilities of very substantial savings in speeded work and will, in most instances, pay for its preparation in a very short time.

Reducing the overhead operations to the functions essential for performance, by stripping them of all unnecessary forms, offices, titles and personnel is a further necessity and they then should be set forth in standardized overhead procedure written down in standard practice instructions. These should result in budgeted costs for overhead cost control. Overhead costs can thus be maintained and controlled by means of budgets just as direct labor and material costs are controlled by means of the drive associated with incentive systems. A significant method of noting the cost of overhead operations is to measure each overhead operation in terms of hours to prepare, and to compare it against hours needed to manufacture a product.

Further major reduction in plant costs may be made by using production control as a cost reduction tool and by placing plant maintenance on a "preventive maintenance" basis through a periodic inspection of all equipment to be sure (1) that it is functioning properly and is correctly adjusted, (2) that worn or defective parts are detected and repaired or replaced before a costly major break-

down occurs, (3) that equipment is kept clean and (4) that machines are properly lubricated.

No plan of cost reduction through budgetary control is effective unless there is a willingness to follow it up. The follow up should be made with the same care as was used in preparing the plan. All employees concerned with the establishment of the plan are equally concerned with later control, from the foreman up to the president or executive committee.

Checklist of Cost Reduction Aspects of Budgetary Control

The many advantages of budgetary control, each of which adds its share to cost reduction, may be summarized as follows.

1. It prevents waste, since it regulates the spending of money for a definite purpose and in accordance with appropriations established by the executives of the business.
2. It places definitely—just where it belongs—the responsibility for each function of the business.
3. It makes for co-ordination. It compels all departments of a business to cooperate in attaining the results fixed by the budget.
4. It presents in cold figures the best judgment of executives committed to a definite business objective, thus guarding against undue optimism which often leads to overexpansion.
5. It acts as a safety signal for management, since it indicates the variance between estimates and the actual results obtained. Thus, it shows when to proceed cautiously, as well as when manufacturing or merchandising expansion may be safely undertaken. It is an automatic check on the judgment of the executives—a check frequently revealing losses in time to stop the waste.
6. It is the most potent force in business for the conservation of the resources of business, since it regulates the spending of money within the confines of income.
7. It is invaluable to management in determining the effect of sales, production and financial policies.
8. It compels management to study its markets, products, methods and services thus disclosing ways and means for strengthening and enlarging the business.
9. It compels management to study and to plan for the most economical use of labor, material and expense.
10. It sets up a target to shoot at and provides a gauge for measuring the accuracy of the shot. It is a test of the ability of management to make things happen in accordance with a well ordered plan.
11. It compels management to fortify itself with adequate accounting, cost accounting and financial records.

Budgetary control also has the following financial advantages:

1. It has a marked influence on the most economical use of working capital, since it is planned to make the maximum use of plant facilities and current assets.
2. It is the only means for predetermining when and to what extent financing will be necessary.
3. Management which has developed a well ordered budget plan, and which operates accordingly, finds greater favor with its banker and board of directors.

DO YOU PLAN COST CONTROL PROCEDURES IN A VACUUM?

SOME TIME AGO a controller of a large company discussed with me the problem he had in setting up a new cost control program for one of the important divisions of his company. The new cost plan was well conceived and was definitely an improvement over the existing plan. Nevertheless, increasing evidence made him fearful and worried that the plan wasn't going to work out in practice as well as he had hoped it would.

We discussed and analyzed the situation at some length in an effort to discover the reasons for his conviction. It developed that the basic problem arose from his method of approach. He had a good plan, but he was spending a great deal of time and effort, at that point, in the *procedural* details needed for the plan's implementation. Jumping directly from the basic plan into procedures appeared to be the logical next step, but it actually left a big gap which he had apparently sensed but had been unable to diagnose.

The gap in this case resulted from the failure of the controller to bring the division's responsible executives into the picture at the time he had developed his basic plan. Operating executives are entitled to participate in the development of such an important tool designed to help them operate more efficiently. They can and do make excellent suggestions toward tailoring the plan to meet their specific needs. Also, and most important, their participation in the plan's development gives them the understanding and interest to promote its usefulness and success.

Once the fundamental concept of and approach to cost control, as reflected in the basic plan, is really understood by the responsible executives and the basic plan is modified, as it may well be, through such discussions, the controller is in a well-informed and confident position to proceed with the next steps. He can then go ahead with the selection of appropriate cost control centers. Here again, responsible executives must be fully consulted to be certain that relatively important cost areas are selected and that each cost area is the responsibility of a single executive who is empowered to take corrective action on unsatisfactory situations as soon as such action is indicated.

Then comes the job of designing the periodic cost control statements. This should be done by lines of responsibility and authority. Obviously, it is practically useless to present a statement which combines the operations of two or more executives in one set of figures. Real control, in the final analysis, can be exercised only by people with authority. Control statements in themselves control nothing. They are merely tools which guide the action of responsible executives. Executives, from the top down, must have facts and figures which are immediately related to the functions and activities of the people for whose acts they are responsible and over whom they exercise authority.

Only at this point, and not before, is it logical to develop clerical methods and procedures required to make the basic plan operative. After we had analyzed the problem in this manner the controller in question saw that he was developing procedures prematurely. Attempting to lay out procedures before the basic plan itself was acceptable to operating executives, and before the control organizational structure was clearly established with them, just could not help but confuse the whole program.

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VIEW

WHAT ARE THE OBJECTIONS TO COST ACCOUNTING IN SMALL BUSINESSES?

IT APPEARS TO BE SOMEWHAT unusual for persons experienced in cost accounting to give a great deal of thought to problems of small business. There could be several reasons for this lack of interest:

1. Extreme variations between proposed and accepted systems of cost accounting for small business.
2. The fact that textbooks confine their teachings to systems and problems which are mainly applicable to large companies —primarily manufacturing.
3. The hesitancy of accountants to educate small businessmen as to the importance of this tool as it would apply to their own businesses. Large companies offer a measure of security which attracts a great number of young accountants who get their experience with these large concerns and consequently think only in terms of larger operations.

So much for the lack of interest, on the part of accountants, in small business. How about the other side of the picture—the reluctance of the small owner-managed business to accept these cost devices and systems? A procedure of cost accounting offers nothing so obviously useful, for instance, as the installation of the double entry method of bookkeeping which supplies the trial balance and solution to many tax problems. But, to be more specific, there are a number of major reasons, based principally on misconceptions, which foster lack of interest in cost accounting on the part of the small businessman.

Costliness is probably the outstanding objection that the small businessman has. Discussions, papers and textbooks have convinced the small businessman that it takes an elaborate set-up and many highly paid specialists to operate an effective cost system. Of course, cost accounting devices do add additional work to the normal accounting procedures, but they often pay for themselves and add to profit. For instance, the installation of a perpetual type inventory system will often reduce net expenses since it will reduce the cost of physical inventories required for financial reports to banks and other lending institutions. Then again, small operators often fail to realize that the smaller firm, the smaller and less costly the devices needed.

Many people likewise think that cost accounting cannot be used by small enterprises. However, cost determinations must be made by all businesses regardless of size.

The misconception that only manufacturing concerns need cost accounting is sometimes expressed. Many small businesses are in service industries. Judging from the statistics of business failures, they need sound cost accounting at least as much as manufacturing concerns. Of course, a need for cost accounting is only one factor which causes these failures, but it is an important one.

Finally, we have the proprietor who is familiar with all his operations and is constantly present at his business. This circumstance might minimize the need for cost accounting, but only until the business expands beyond the control capacity of one man. In any case, the accountant, having knowledge of other businesses of the same type, can aid this proprietor and prevent his making mistakes which others in the same business have made.

The problems of production, cost and control are fundamentally the same in large and small business. The difference stems from the extent to which the detailed procedures should be superimposed on the basic essential structure in order to provide the information which the management needs.

M. D. MORRIS, *Chattanooga*

Continuous Cost Reduction

by PAUL M. DEAL

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Devoted to the background for cost reduction and some techniques necessary to attain it, this paper describes in detail a method of reporting cost reduction achievements in relation to the budgeted reduction in terms of specific components of organization.

COST REDUCTION DENOTES A FIELD of activity distinctly different from that of cost control. Cost reduction is the relatively permanent lowering of the basic manufacturing or selling costs of a product. Cost control entails holding costs within predetermined limits regardless of the magnitude of these limits.

What Planned Cost Reduction Means

Any manufacturing or selling organization which stays in business long in the face of competition must make cost reductions. A certain amount of cost reduction comes simply as a result of common sense business management and, for some companies with new products or little competition, this may be sufficient for a time. However, the way to discourage competition on new products is to lower costs and selling prices fast enough to keep competitors off balance. A planned and organized cost reduction program is the most effective way to do this.

By a planned cost reduction program is meant one which has a goal or budget and a well understood and publicized technique for reporting cost reduction results against the budget. The budget for cost reduction must be supported, at least in part, by specific projects, and not based simply on faith and hope. Personnel should be educated in the meaning and need for cost reduction and the methods of reporting savings. Responsibility for meeting cost reduction budgets should be assigned, understood and accepted. Such a planned cost reduction program can succeed only if it has the support of top management, and results will be proportionate to the interest displayed from this quarter.

When a standard cost system is in effect, convenient standards from which to measure cost reduction are available, but a standard cost system is not essential for measuring and reporting cost reduction activity. Any well-organized manufacturing or selling enterprise has some standards of good performance, whether or not these are formally reflected in standard cost procedures. Such

standards of performance, for use as a starting point for cost reduction, may be cost estimates intended primarily as a basis for bidding on a job or for establishing selling prices. Other examples are standards or estimates based on time studies, historical material usage studies, industry standards, or over-all measurements of cost related to physical output, such as dollars of labor per pound of product or per foot of material used.

Needed: Company-wide Inspiration and Cooperation

While a cost reduction program has its foundations in assignment of responsibility for meeting budgeted savings, the creative character of cost reduction should not be overlooked. Savings are made from new designs, new clerical methods, new selling ideas, new manufacturing processes. Such creative thinking cannot be driven to meet a budget. It must be inspired. It must be regarded, throughout the organization, as fun to come up with new ideas for savings, to see them evaluated and reported, and to have the satisfaction of recognition for a job well done.

Among the requirements for successful creative thinking are a clearcut recognition of problems to be solved and an environment receptive to new ideas. It is therefore desirable to provide some formal training in the techniques of cost reduction. In our company, we now give regularly, to foremen, rate setters and machinery and equipment planners, a course consisting of forty to fifty class hours and known as motion time study course. Courses such as this one, which can be undertaken in a business of any size, have a stimulating influence on cost reduction activities.

A successful reduction program must be a continuing one. "One-shot" campaigns to reduce cost may cause the "patient" to have a deceptively quick recovery, followed by a slow demise. This is often done by calling in independent management consulting firms to give a quick injection to a business which is not competitive costwise. The real trouble may be that management has not been sold on the idea that an organized cost reduction activity is a regular and continuing function of management.

There is a danger in assigning responsibility for meeting cost reduction budgets too closely along functional lines. Unlike cost control, where responsibility for performance should be pin-pointed to individuals, cost reduction usually requires the close cooperation of two or more of the functions of marketing, engineering, manufacturing, and financial or other similar organization groupings. It is, for example, unworkable to assign responsibility for meeting a budget for cost reduction of direct material solely to a manufacturing group

195- COST REDUCTION BUDGET

Organization Component	Units to be Produced	Cost of Output M$	Anticipated Cost Reduction Material M$	Labor M$	Expense M$	Total M$	% to Cost of Output
Section 1	684 500	$ 11 410	$ 150.0	$ 450.0	$ 83.5	$ 683.5	5.990
" 15	59 300	8 172	79.5	292.8	46.0	418.3	5.119
" 19	15 600	7 637	74.2	273.6	43.0	390.8	5.117
" 17	1 403 000	6 891	33.3	271.7	67.4	372.4	5.404
Total	2 162 400	$ 34 110	$ 337.0	$1 288.1	$ 239.9	$1 865.0	5.467

MONTHLY REPORT OF SAVINGS

December 195- and Year-to-Date

Section	Current Month at Annual Rate Mat. M$	Labor M$	Exp. M$	Total M$	% to Cost of Output	Year-To-Date at Annual Rate Mat. M$	Labor M$	Exp. M$	Total M$	% to Cost of Output	Year to Date Budget % to Cost of Output	% of Attainment to Budget	Open Projects Total M$	Bal. Needed to Meet Budget for 1952 M$
1	.3	8.0	.3	8.6	.749	100.0	195.0	50.5	345.6	3.028	5.990	51	422.5	337.9
15	12.5	26.1	5.2	43.8	5.360	119.6	283.2	65.9	468.7	5.735	5.119	112	175.4	(50.4)
19	8.8	25.7	-	34.5	4.517	167.1	187.0	72.2	426.3	5.581	5.117	109	135.5	(35.5)
17	11.7	24.0	24.1	59.8	8.683	105.5	201.5	65.6	372.6	5.407	5.404	100	82.7	(.2)
Total	33.3	83.8	29.6	146.7	4.300	492.3	866.7	254.2	1613.2	4.729	5.467	86	816.1	251.8

EXHIBIT 1

when the engineering group may specify and control the amount and kind of material used. Generally, the most satisfactory approach to the problem is to budget and assign cost reduction responsibility along product lines in the hands of a cross-functional committee concerned with the particular line of product. The committee might possibly be made up of a manufacturing superintendent, an engineer, a marketing man, and a cost man.

Bringing Cost Reduction Proposals to the Surface

Once a well-organized cost reduction program is functioning, the cost accountant should audit and approve savings reported and should issue savings reports. But more than this he has a responsibility to exercise leadership in sparking the whole program to keep it vigorous and active. To do so, one necessity is to know well, and to keep productive, the sources from which cost reduction ideas may flow.

Ideas for cost reduction and control may come from a suggestion system aimed at gleaning ideas from nonsupervisory employees. In addition to such a plan, we have, in our company, regular cost reduction committees and a clerical procedures group. The savings they effect are reported as cost reduction. Also, the purchasing group has an organized activity in which a buyer, an engineer, a manufacturing man and a cost man meet frequently to consider the possible savings from (1) buying versus making and (2) the use of new, different or cheaper purchased materials and parts. Large companies, particularly, have a potential reservoir of cost reduction ideas in research and laboratory activities.

When maximum profit on investment is the major objective of the business, reduction of investment may be as fruitful as cost reduction. For example, a new manufacturing technique or change in equipment which makes it possible to get fifteen per cent more production through a $40,000 oven instead of buying a new oven, is just as real a cost reduction as those affecting direct material and direct labor. Likewise, new and different terms of sales or collection procedures may reduce the capital tied up in receivables. In our company we have budgeted for the reduction, control and improved turnover of inventories.

The Cost Reduction Budget at Work

The upper half of Exhibit 1 shows, with dollar amounts in thousands, our cost reduction budget for 1952 for one department, segregated into its four component manufacturing sections. Each section makes related types of motors.

DECEMBER 195- COST REDUCTIONS

Material	Labor	Expense	Total	Explanation
	1 408		1 408	Increase test limits to reduce rework
	1 053		1 053	Omit staking commutator after assembly into motor
(104)-	1 604		1 500	Acid dip pole pieces instead of hand sanding
	1 333		1 333	Omit sanding bearing retainer
716	4 752		5 468	Change wire size to improve winding and reduce rework and scrap
	1 224		1 224	Punch washer complete, eliminate turn O. D.
1 384	149		1 533	Heat sleeve to expand before pressing on shaft to reduce rework and scrap
		1 812	1 812	Use Sal Craft grinding wheel balancer to save material
- 426	1 023		1 447	Anneal rotors to improve quality and reduce rework and scrap
	1 440		1 440	Combine repair operations to reduce number of operators
	1 579		1 579	Change method of winding and placing
	4 598		4 598	" " " "
		1 799	1 799	Use staples instead of cleats to secure papers to wooden crates
9 363	1 181		10 544	Change type and size of mica to reduce rework and scrap on commutator
	1 367		1 367	Improve method to reduce assembly time
	1 038		1 038	Change from 2-3/4" Cleveland to 2-5/8" Gridley
	2 002		2 002	Automatic ream of quills instead of hand machine
465	694		1 159	Improve coil spreading on armatures
927	1 390		2 317	Improve banding on armatures
1 390	2 086		3 476	Improve slot insulation on armatures
839	302	34	1 175	Assemble screen in flange by spot welding
1 418	2 753		4 171	Improve coil forming on armature
1 576	3 058		4 634	Improve resistance control of welder
1 970	8 363		10 333	Offset leads and omit roll band on armature
	5 850		5 850	Change thread mill from 1 to 2 machine base
		6 820	6 820	Change from unit pack to pallet pack
	2 716		2 716	Add tool to drill hole during machine cycle and omit separate drill press
		1 267	1 267	Change machine head to reduce down time
	3 309	12 050	15 359	Purchase 5 move die for Bliss punch press to make stator & rotor punchings
	4 198	2 900	7 098	Purchase 5 move die for Bliss punch press to make stator & rotor punchings
	1 330		1 330	Eliminate lacing operation of stator
	3 810		3 810	New layout to combine insulation operations
11 695	(331)		11 364	Salvage castings with bushings and remachine
	3 867		3 867	Install permanent mounted windhet to replace portable type
32 063	69 146	-26 682	127 891	Total of 34 Projects
1 245	14 655	2 945	18 845	Total of 48 Others
33 308	83 801	29 627	146 736	Grand Total For December 195- - 82 Projects Completed

EXHIBIT 2

A committee representing engineering, manufacturing, marketing, and cost functions is responsible for obtaining the budgeted savings. Experience gathered in more than ten years of this type of cost reduction reporting indicated that for this department good cost reduction activity should yield savings at an annual rate equivalent to about five per cent of the annual cost of output. (The cost reduction budget in Exhibit 1 shows the units of anticipated production for each section and the total. These units are the same as the sales budget and are supported by a great amount of detail as to types and models.) Cost reductions once made do not last forever because of new products and changing designs and, of course, there are many offsetting cost increases which are not reported.

When a cost reduction project is completed, the direct material and labor savings are calculated and then put on an annual basis by multiplying by the budgeted number of annual units for that model, type, or section. The annual dollars of savings so determined are then reported on a monthly and year-to-date basis and shown as a per cent of the budgeted annual output. Thus unit cost reduction savings are expressed as an annual rate by multiplying by the same volume as was used in determining the output budget. This procedure eliminates the need throughout the year of adjusting the budgeted dollars of

savings and the volume used for reporting savings, when actual volume of sales varies from the sales budget.

The figures shown on the bottom part of Exhibit 1 are the results for a year for one department as against the budget shown in the top portion of the exhibit, with dollars in thousands. Since the report covers the last month of the fiscal year, the results for the current month are already at an annual rate for the year in question and need not be converted. Generally we do not have realizations as low as the fifty-one per cent shown for Section 1 and there are some special reasons why this occurred.

It will be noted that the last two columns show the amount of open projects still being worked upon. As a rule, specific open projects should be equal to at least half the annual cost reduction budget. Exhibit 2 shows a sample of the projects completed in December and reported in that month as savings making up the figure of $146,700 shown on Exhibit 1. (Total column under Current Month at Annual Rate.)

Characteristics of a Cost Reduction Program

In this article, there has been indicated a planned approach to cost reduction and some of the organizational prerequisites and essential techniques have been developed. Finally the cost reduction budget and realization of one department has been portrayed. The emphasis has been on a deliberate, continuous, creative and company-wide program. A successful cost reduction program must have the following characteristics:

1. It must be organized and budgeted, and provide for measurement of results.
2. Responsibility for achieving goals must be fixed and accepted.
3. It must be supported by management.
4. The program must be a continuing one.
5. All functions of the business must have an assigned part and give the program active support.
6. The field of activity should extend beyond obtaining direct material, direct labor and burden savings to include other factors affecting return on investment.

Cost Reduction by Brute Force

by ALWYN M. HARTOGENSIS

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The author outlines a drastic approach to cost reduction by the use of what is termed "brute force." This method is represented as applicable only under emergency conditions when time is of the essence. Since it is applied only infrequently in practice, it is often done without intelligent preparation. Accordingly, the author indicates that the cost accountant should be familiar with the technique before he has occasion to use it, in the probable absence of time for study when the need does arise.

COST REDUCTION USUALLY IS SOUGHT by a program of orderly and systematic investigation of all cost factors and of the possibilities for their reduction. Such a program was described by the writer in an article, "Cost Reduction—Prescription for Tomorrow's Profits," published in the January 1953 *N.A.C.A. Bulletin*. Despite the fact that this type of program takes time and a strong determination by all concerned to find and use the opportunities for cost reduction, it is the one normally used by well managed companies and it is to be generally recommended.

However, there are times when the orthodox scientific approach to cost reduction simply will not do. Time may be a vital factor for the simple reason that cash would run out before any leisurely methods of cost reduction could be applied. Under such conditions the cost accountant must be realistic enough to recognize that time is of the essence and design his program to meet the deadline dictated by necessity. Scientific method may come later—survival comes first.

Another possibility is that the attitude of supervision may be such that no amount of reasoning or persuasion would get any appreciable cost reduction results. Sometimes, in such a case, top management may be justified in what is called "cracking heads," because there is no other solution to the problem. Here the "brute force" approach may weed out the incompetent supervisors and convince the others that the job of cost reduction can and must be done. "Mopping up" (completing the cost reduction task as to details) may then be effected by orthodox and less stringent methods.

There have been occasions in the writer's experience, in line with both the foregoing situations, when neither time nor other circumstances would permit the orthodox approach to the problem. In at least one case, the temperament

and policies of top management and the financial condition of the company demanded a more direct and positive approach. The hammer replaced the chisel. It worked.

What Is the "Brute Force Approach?"

Cost reduction by "brute force" is an aspect of profit planning. It utilizes the services of the accountant to a much greater extent than the ordinary cost reduction program. Its emphasis is on *control* in its most rugged and direct sense. It establishes the limits of expenditure which will permit achievement of the desired profit. Then it delegates responsibility to line management to find ways and means to keep expenditures within the permissible limits.

Obviously, management in each department will use some of the more refined techniques discussed in the article referred to above, in reducing costs to their permissible limit. The force approach usually looks for quicker results, but otherwise the difference is not so much in technique as in approach. In the orthodox approach, the question is: Where and how much can cost be reduced? In the "brute force" approach, cost *must* be reduced by a given amount within a given time. The only question is: How can it best be done?

The "brute force" approach to cost reduction can be used on either a flexible or a fixed basis. On the flexible basis, it is directed to reducing the break-even point and increasing the percentage margin over variable cost, setting goals for the reduction of fixed costs and of variable cost per unit. On the fixed basis, a level of sales volume at some definite sales price basis must be forecast and the program directed to the realization of a desired amount of profit on the expected sales. In the successful case to which reference has been made, a detailed forecast of sales volume and prices by individual products was worked up, based on a very thorough market survey. In another successful case, executed by a business associate of the writer, the flexible basis was used. There was no forecast of sales and no profit goal but merely a cost-level objective. Subsequent discussion here will be confined to the fixed basis of forcing cost reduction, that is, setting a profit objective based on a sales forecast. From this description, the flexible-basis approach will also become clear.

Target Profit and Target Costs

Wishful thinking will not realize profit. The profit goal must be practical. In the first of the two cases cited above, the writer asked the president of the company, on presenting to him the results of the market study and sales forecast ($35,000,000) for the ensuing fiscal year, how much he thought he could

CALCULATION OF TARGET COSTS

	Current Year	Target Year		Increase (Decrease)
		Present Basis	Target	Over Present Basis
Net Sales	30,768	34,100	*35,800	* 1,700
Income (loss) before taxes	(2,333)	(1,476)	2,400	3,876
Total allowable costs	33,101	35,576	33,400	(2,176)
Interest and other income deductions	496	496	475	(21)
Available for operation, etc.	32,605	35,080	32,925	(2,155)
Spent or to be spent for:				
Materials, etc.	11,932	13,230	13,100	(130)
# Direct Labor	5,186	5,700	5,400	(300)
Manufacturing Expense:				
# Production departments	2,657	2,800	2,387	(413)
# Service departments, etc.	8,596	8,900	7,938	(962)
# Selling expenses	2,232	2,300	2,400	100
# General and administrative expenses	2,125	2,150	1,700	(450)
Total expenditures	32,728	35,080	32,925	(2,155)
Net Change in inventory	(123)	--	--	--

* Increased sales over "present basis" due to price increases.

These items supported by departmental and sales office schedules.

EXHIBIT 1

carry to net profit after income taxes. The president offered a snap judgment of ten per cent. Since this would be equivalent to seventeen per cent before taxes at the then existing tax rates, the writer doubted the likelihood of the achievement of this goal and suggested an objective of $2,400,000 before income taxes or $1,500,000 after income taxes, which was agreed to.

In view of the positive methods used to achieve the goal, an over-optimistic view could have been extremely harmful and self-defeating. In spite of a large expected increase in sales volume, costs were rising, the company was suffering a two-million dollar loss in the year coming to a close, and stringent economies were necessary just to break even. These factors had to be taken into consideration in establishing the profit goal.

When, as in the case just mentioned, sales and profit goals are set, the cost goal follows. By adding nonoperating income to expected sales and deducting the profit goal adjusted to a before-income tax basis, total allowable cost is

obtained. Exhibit 1 shows the manner of calculation, except for departmental detail. At this point, it is well to scrutinize nonoperating income deductions, since any reduction which can be effected in these items contributes to the profit goal. Economies in items such as maintenance of rentable property can often be effected. Even interest expense should not be considered irreducible until possible means of reduction have been sought.

When the target levels of nonoperating income and income deductions have been established, the total amount of allowable operating costs will be determinable. These include cost of goods sold, selling expense, administrative and general expense, sometimes including research and development expenses. Cost of goods sold must be corrected for inventory changes if the latter are material.

Assigning Responsibility for Cost Reduction

The procedure to this point results in the establishment of a target allowable cost for the sum of manufacturing costs, selling expense, administrative and general expense, and any other operating expenses. We can now go ahead with the problem of administering the program for realizing its goals. The most critical step in this approach to cost reduction is in assigning responsibility for reduction to the target allowable operating costs. Assuming that the total reduction sought is practicable, the assignment of too much to one area means that the requirements for another area are too loose.

The first step is to take the costs of the period immediately preceding, to set them up by departments—direct and indirect, including administrative, sales, and engineering departments—and by principal classes of materials, direct and indirect labor and other expenses. The fixed cost components must then be adjusted for known or anticipated quantity and price changes and the variable cost components for quantity and price changes and also for anticipated changes in volume of production. This provides the "present-basis" of future costs.

The difference between the "present-basis" of future costs and the target allowable operating costs represents the required amount of cost reduction. The required amount of cost reduction must be assigned to various departments as their respective shares of responsibility for obtaining the profit goal. It is the most important and difficult part of the operation because, with this approach, the establishment of the amount of cost reduction precedes any study of how, where, and what costs can be reduced and by how much. Any attempt at cross-the-board reduction is futile.

Often some rule-of-thumb basis may serve as a guide for assigning the cost reduction goal. For example, in the case referred to before, rule-of-thumb

estimates indicated that 350 employees should be able to handle all phases of production control in one plant of the company even though 500 were employed in that department. On a Thursday afternoon, the production control manager was told to lay off 150 employees by the following Monday. He did, and he managed to carry on without too much difficulty. While this might suggest that the department was overmanned, and it is stronger treatment than the writer would ordinarily recommend, nevertheless, it worked. It also suggests that very strong and able middle management is essential to a successful program of this kind.

Some decisions necessarily are purely arbitrary, such as those which aim at reducing scrap losses by a given percentage or which direct the product design function to engineer so many dollars of materials cost out of the product. These goals may or may not be achieved. They may also be exceeded, but they provide objectives which become the responsibility of the appropriate departments.

It will sometimes be necessary to provide for increases in some cost categories in order to secure greater reductions in other cost categories. The most obvious example is the increase of fixed costs due to new or improved equipment acquired in order to reduce labor or other costs.

The general office departments and the sales department, as well as the factory, should participate in the cost reduction effort. In some companies there is a tendency towards extravagance in these departments. However, sales department allowances must be based on the sales program necessary to move the expected volume.

When the necessary cost reduction objectives have been assigned to the various responsible department heads, the respective amounts should be deducted from the "present-basis" of future costs as previously described, the remainder representing the new cost goals. These calculations might be made in detailed terms of materials, labor, expense, and even in greater detail. However, it seems preferable, *after* the calculations have been made, to summarize in terms of total allowable costs by departments. Since the department heads are called on to find ways and means of operating under the new ceiling allowances, it is only right that they be permitted to make the reductions where they can. Hence, what results from the planning is a top spending allowance for each department—a flat sum for each supervision responsible for cost reduction.

Making the Programs Work

The cost reduction planning should be undertaken by top management, with such staff assistance and advice as necessary. This statement may seem to reverse

good management practice. However, under the conditions to which the stringent approach applies, it would be impossible to obtain agreement of department heads to the reductions contemplated. In taking the planning initiative, top management is merely deciding what it must expect from its subordinates. The approach is most used by companies which are in financial difficulties or which have been losing money for some time. Obviously an emergency measure, it can be a very effective one. When the total goals of the various departments have been determined, it is then in order to explain the necessity for "target" cost reduction to the department heads and to ask for their efforts to make the program successful, for these individuals and their subordinates must find the means of accomplishing the goals set.

When the department head has received his total expenditure allowance, he should be asked to prepare his regular budgets, making his reductions where he thinks best but not exceeding his ceiling in total. Where formal budgets have not been in use, the ceiling allowance for each department becomes an overall spending budget and the first step in budgetary control is accomplished. Incidentally, the chart of accounts must necessarily be arranged to show the responsibility in the organization for the incidence and reduction of costs. This is always a prerequisite to cost control, but many companies have neglected it.

In most cases, it will be necessary to allow for a period of time to accomplish the expected reduction in cost. This may be reflected in monthly or quarterly budgets. It is up to the individual department heads to allocate their overall spending allowances over the various objects of expenditure. For example, the amounts available for supervision, clerical, and indirect labor determine the number of employees which may be employed in these respective categories. Other expenses also will be reduced or eliminated.

Of course, these goals will appear to be impossible to the department heads and supervisors on whom the pressure will fall. It reminds the writer of the time when he was contemplating marriage. He tried to prepare a budget to plan how two could live on his salary. In no way could he figure on paper how to make ends meet. But, encouraged by the fact that some of his friends were getting along on lower incomes, he threw away the budgets and took the big step. He did all right. There is nothing like limited funds to force economy. This applies to supervisors in spending company funds just as much as in spending their own. There does exist a limit to how much reduction is possible. It has been stated that the initial targets must be realistic and this bears repetition. But the pressure of an absolute ceiling makes possible economies which can be attained in no other way.

The monthly budget comparisons will show the progress being made in the cost reduction program and will disclose those department heads who are failing to meet their objectives. They can be given special assistance or, perhaps, replaced where clearly unqualified or uncooperative. However, the budget reports show the failures after the money is spent. Effective control depends on taking the necessary steps beforehand in order to avoid overspending. Emphasis must be placed on forehanded action. This demands that hires and lay-offs, requisitions, and other commitments be watched closely. Superintendents, for example, should assure themselves that their foremen have taken the steps necessary to restrain their spending to budget limits. Such positive measures are essential to minimize failures reported in the monthly budget reports.

Shall the Approach be High Pressure, Low Pressure or In Between?

Although the brute force approach to cost reduction will seem to be rugged, it differs from the usual approach only in emphasis and degree. This may be illustrated by quotation from a paragraph in the article of the writer, already cited:

> Often it is helpful to estimate and establish an objective for cost reduction. At the inception of the program, a goal may be established for the first year of operation of the program as a whole and for each executive and supervisor who has responsibility for any phase of any class of costs. In setting goals for cost reduction, careful judgement is needed. Some costs may be susceptible of substantial reduction, while others may be nearly untouchable. At the start of the program, it may be difficult to decide whether any class or group of costs contains a potential for reduction. An intelligent guess should be made. The responsible supervisor cannot be held too closely to attaining the reduction attempted, but, whether or not it is attained (it might be surpassed), the establishment of an objective is desirable and normally will lead to greater savings than otherwise.

In this paragraph, the low-pressure approach stands out in marked contrast to the presently described high-pressure approach. The former will be used by profitable companies which desire to further improve their position or to meet expected threats from competition or adverse economic conditions. The latter approach will be used by companies presently in a loss position or short of funds. It is an instrument of necessity, and can be a most effective one.

Most important, there are possible various degrees in which a compromise between the two approaches may be used. These variations are possible in connection with (1) the amount of the cost reduction objectives, (2) the period of time allowed to reach the objectives, and (3) the pressure exerted to realize attainment of the full objectives. The program may be regulated to meet the urgency of the situation.

Departmentalization for Lower Cost Levels

by MARION H. SIMPSEN

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This paper discusses standards and budgets for cost control and as a foundation for cost reduction, against the background of necessary departmentalization of manufacturing operations. Specific departmental reports, which are the products of a control system, are presented and specific cost reductions resulting from application of the system are noted, together with problems involved in the effective administration of budgets and a budget-based cost reduction program.

THE THEME OF THIS ARTICLE bears on the problems of cost control and reduction and is more particularly directed to the need for departmentalization, especially for cost purposes, in achieving desired results. To begin with, what are desired results? Perhaps we can liken cost control and cost reduction endeavors to the art of driving a modern car on an icy pavement. Most drivers have learned that putting on the brakes too suddenly will start a skid just as easily as stepping on the gas too suddenly. In cost reduction, an abrupt curtailment can throw the enterprise into a loss skid just as quickly as too much uncontrolled spending. In other words, management must know just when and to what extent brakes must be put on expenditures and also when it is necessary to increase expenditures to keep the operation on the road to profits. For example, if $10,000 of spoiled work each month were eliminated at an additional monthly control cost of $15,000, one expense item would be unduly curtailed by reason of the fact that it resulted in a disproportionate increase in another expensive item. The accountant should point out to management that the law of diminishing returns applies to cost reduction programs as well as to sale endeavors.

Inadequacy of Plant-Wide Costs

Coming now to the particular theme of this article, the control and reduction of costs by departmentalization, suppose we start with a typical manufacturing expense schedule covering the operations of an entire plant for a month. In Exhibit 1, the factory operation is classified into natural expense accounts—which would run to some fifty items if full detail were given—and the plant manager must control costs by further detailed analysis. This exhibit represents the expense classification and the approximate overhead expenses you might

MANUFACTURING EXPENSE SCHEDULE

11	Salaries and Wages - Supervisory	$ 35,000
12	Salaries and Wages - Clerical	14,000
13	Indirect Production Labor	10,000
72	Property Taxes	3,000
73	Social Security Taxes	3,200
		$198,975

EXHIBIT 1

find in a factory having a yearly sales volume of ten million dollars and employing about six hundred people.

The normal procedure, in the absence of departmentalization (to assume the extreme case) is to prepare detailed analyses of the accounts which seem to be particularly out of line. The cost accountant prepares such schedules, showing each item charged during the month to each expense account analyzed. The plant manager must then try to use this information to do something about controlling current costs of factory operation. The plant manager is in the position of having an excess of detail. The analyses obviously contains matter both relevant and irrelevant to excessive spending. He knows very definitely that there is something wrong in his cost picture but cannot quite "pin it down." He is like a reader who asks for a book on budgetary control and is given a dictionary. The dictionary includes all the words but they are not in the right order for his purposes.

Also in the absence of departmentalization of costs, the plant manager is really the sole individual in the plant who is supplied any kind of information about costs. Naturally, there are always some conscientious foremen, supervisors, and workmen who do not deliberately waste materials and labor but no one can be every effective in controlling the costs of his function without some cost figures to guide him. Departmental costs are that guide and they enable the plant manager to shift some of the responsibility for controlling costs from his shoulders to those of his subordinates.

Basis of Departmental Costs: An Example

Many companies have a semblance of departmental organization which is necessary for other purposes and it may thus seem a very simple matter to accumulate operating costs by departments and apply these costs in cost control.

However, having a skeleton departmental organization is only a beginning for cost control.

This is well-illustrated in the case of a manufacturing company, the experience of which is reflected here. Exhibit 2 shows a list of the departments which were found necessary. These departments were chiefly on a functional basis and corresponded to the supervisory organization chart. Usually one foreman was in charge of each of the departments listed. After establishing these departments, the next step was to set up necessary plant reporting for labor distribution and for supply and material usage. This was an important element as, without accurate reporting at the source, accounting information would necessarily be inaccurate. I know that some shop people and some people very high in the management group have the impression that accountants with modern office machinery can make figures accurate simply by multiplying and dividing enough times and by preparing enough intricate schedules. However, the fact is that accounting information can only be as accurate as the source data on which it is based. Therefore, it is important to supplement the departmental cost segregation basis by properly defining expense accounts and issuing reporting instructions in language the shop personnel can readily understand. Exhibit 3 is an example of the procedures issued in the program being described.

Rules and definitions had to be agreed upon to fit in with management's concept of the organization. For instance, we may charge foremen's salaries to their superior's department instead of their own on the basis that the superior who controls the foreman's salary and actions should be charged for it. Of course, if the same costs are used for production costing, an adjustment must be made to charge these salaries to the individual departments, either as an allocation or a specific charge.

Measuring Sticks and Reports

After establishing the departments and the natural expense accounts in each department, we then determined what our measure of performance was to be for each department. An adequate measuring stick for cost performance is, of course, very necessary. Usually it is not a simple matter of selecting one measuring stick and using that for all departments as that would be somewhat like adding apples and potatoes. Fortunately, our problem in the production departments was not too difficult. For some time we had been using a unit of output in work measurement based on the Bedeaux unit. The Bedeaux unit is a unit of measurement of human output and may be compared to horsepower hours in an engine. It is approximately the amount of work a normal man will do in

LIST OF DEPARTMENTS FOUND NECESSARY FOR COST ADMINISTRATION

MANUFACTURING DEPARTMENTS		STAFF AND SERVICE DEPARTMENTS	
702	Cutting	750	General Factory
704	Forging	751	Production Control
707	Heat Treat	752	Production Engineering
711	Mills, Drills, and Lathes	753	Materials Handling
712	Final Case Manufacturing	754	Electrical Maintenance
714	Hob and Grinding	755	Housekeeping
720	Parts Welding	757	Mechanical Maintenance
723	Initial Case Fabrication	760	Experimental
724	Wheel Manufacturing	761	Tool Machining
730	Electric Motors	766	Tool Grinding
732	Assembly	769	Purchasing
737	Clean and Paint	770	Engineering
738	Dozer Check Out	772	Quality
		773	Salvage
		776	Personnel
		782	Traffic
		783	Shipping
		790	Accounting
		799	General and Administrative

EXHIBIT 2

a minute at a normal rate of speed and with a normal output of energy after allowance for fatigue and normal rest. The average efficient workmen should produce about sixty of these units in an hour while a less efficient man may run about forty. A very efficient and experienced workman can reach an output of seventy or eighty units per hour. Under the particular conditions, use of this measure of output provides an excellent means of measuring performance of production departments.

This time study unit, while an excellent means of measuring direct operations did not apply in the case of certain staff and service departments. For instance, in this factory operation a fleet of trucks was used in transporting parts between different plants. Truck ton-miles was the most satisfactory unit for the operating efficiency of the trucking department. In the shipping department product units shipped during the month was the unit. The number of checks written was used in the payroll department. In tool making and other similar departments, output hours was the index to performance.

There are several different methods of establishing budgets. For instance, a budget may be an unattainable goal, one that can be attained only under ideal conditions, or one that can generally be surpassed. In this application we set up the budget on the premise that it should be attainable and that most foremen and supervisors would feel better about meeting and "beating" the budget than never quite attaining it. It was based primarily on history. To obtain this

history, we operated under a departmental cost program for eight months before attempting to set up a budget. We charted these eight months by using scatter charts to determine the portion of fixed costs in each department. Then the accounting and industrial engineering departments agreed upon a suggested budget and met with the foreman and general foreman concerned. The budget figure was reviewed and the foremen presented any objections or arguments. They were also told that the budget would be reviewed from time to time.

The reports issued form the most important part of the program. Exhibit 4 is a copy of the typical departmental expense report issued to each foreman in charge of a production department. A similar report is issued to foremen of staff and service departments. The reports are self-explanatory and show hypothetical current and year-to-date figures for each department. It is a breakdown, not an appraisal of performance. The budget was set for each department in total only and budget performance reported to each foreman as in Exhibit 5. This particular plan of budget performance reporting was adopted on the theory that a foreman should be held accountable only for the total expenses in the department and that he should exercise his own judgment as to the particular distribution of expenditures among the expense accounts. Also, to attempt to budget each particular account complicates the program unnecessarily and is of limited utility because each account will usually be either over or under budget. It is accordingly expected that each foreman should be able to come close to his total budget or have an acceptable explanation.

Difficulty in Appraising Results

Measuring the success of a plan is almost as difficult a task as the development of the plan. I have not found any one method that can be recommended. It seems that each accountant must realize his own particular problem in this respect and report to management on changes in overhead rates, comparisons with past periods, and specific instances of cost savings and control. I have found that perhaps the best illustration of cost savings is in the departmental cost report itself. Meeting the budget that was set after agreement among the accounting department, the chief industrial engineer, and the supervisor involved should be good evidence of accomplishment. In other words, if we set a particular budget or goal for a foreman and he meets it, we believe we are obtaining the desired results. Of course, we may still have a difference of opinion about who was responsible, or whether the expense experienced would have been about the same anyway. Perhaps cost control men are a little like the rainmakers. If it rains critics can always say that it would have rained anyway.

EXAMPLE OF ACCOUNT DEFINITIONS AND REPORTING INSTRUCTIONS

IV Indirect Labor Accounts

Indirect Production Labor - Account 13

This account should be used only in production departments by employees on the hourly or weekly payroll. Those departments in which it may be used are indicated on the Departmental Expense Chart. Account 13 should be charged for all indirect or non-productive labor which cannot be specifically classified as chargeable to any other labor accounts or jobs such as special jobs, 2, 3, 5, 7, etc.

Careful judgement should be exercised to assure accurate distinction between direct labor variations and indirect production labor. For example, necessary clean-up work in the immediate working area in production departments should be charged to Account 5; however, miscellaneous clean-up work should be charged to Account 13 (example 13-702). Some examples of Account 13 charges are:

1. Miscellaneous clean-up work, such as sweeping aisles, etc. when not done by the Housekeeping Department. (Housekeeping Department uses Account 48).

2. Moving of parts, jigs, material, etc. when not necessary for or related to either production jobs, special jobs, tooling up or maintenance.

3. Leadmen in production departments.

General Service Labor - Account 14

This account should be used by all hourly employees in all plant staff and service departments to cover all labor not definitely identifiable as chargeable to any specific labor account or special job. Account 14 is used for much the same type of labor reporting by staff and service departments as Account 13 is used in production departments. Some examples of Account 14 charges are:

1. Inspectors (14-772).

2. Steel Handlers in steel yard (14-751).

3. Materials handling (14-753).

4. Leadmen in all plant staff and service departments.

Shop Meetings (Chapel Services) - Account 16

Chapel services for all employees are held once each week. Account 16 should be used by all employees on the hourly or weekly payroll to report time off for such chapel services. (Examples - 16-711, 16-754).

EXHIBIT 3

I have found that specific instances of cost reduction and control are very convincing. For instance, we had one case where gasoline was issued to all off-the-road vehicles from one pump. No one had been very much interested in keeping detail records and accounting for shortages. When the cost accountant insisted that a record be kept to charge each particular department, we were told it was impossible to account for all the gasoline used. However, we charged the total gasoline delivered each month to the stores department, and credited this department with all gasoline used by other departments on the basis of the record kept. At the end of the first month of this operation, the stores department supervisor protested the charge to his department. He claimed gasoline was obtained during night shift operation and cited other cases of inadequate records to support his contention that he was being charged with excessive shortages. However, we continued to charge this to his department after agreeing to make a shortage allowance. However, when the shortage persisted and grew even larger, an investigation was made and it developed that the gasoline storage tank had a very bad leak. It seems that such a simple matter should have been brought to someone's attention through some other means. However, more often than not, this "other means" fails to function and the loss continues until the cost accountant appears on the scene.

Another incident which occurred in one of the tooling departments is illustrative of the interest supervisors have in a budget plan. When a machine broke down the supervisor called the maintenance department. A maintenance mechanic checked it and said that a new clutch was needed. Upon arrival of the new clutch, costing $250, the mechanics came in to tear down the machine. The tooling supervisor, knowing the cost of this overhaul would be charged to his department, was on the lookout for the overhaul operation. After the old clutch had been removed from the machine, he and the mechanics found that the only replacement needed was a few small pins which were made in our own factory in about 30 minutes. The net result was that the overhaul cost was actually only about $50 whereas it might have run over $300. Again, it is my firm conviction that the new clutch would have been installed and the old clutch discarded had not some system of making the foremen cost conscious been in use.

In another case we had a printed move ticket with two detachable pages glued to a cardboard backing with two sheets of one time carbon. The ticket was recorded each time when the supply ran low and no one checked into the use of it. However, after the installation of our budget system, some inquiry was made as to the excessive cost of these tickets. After checking into the matter,

DEPARTMENTAL COST REPORT - PRODUCTION DEPARTMENTS

FOR DEPARTMENT 711 - Mills, Drills, and Lathes

FOR MONTH OF

	CURRENT MONTH TOTAL	CURRENT MONTH PER 100 UNITS	YEAR TO DATE TOTAL	YEAR TO DATE PER 100 UNITS
1 PRODUCTIVE LABOR	$ 7,144.20	$3.198	$158,577.33	$3.213
2 RE-OPERATION	278.24	.125	3,545.82	.072
3 SET-UP	855.77	.382	14,469.51	.293
4 BAD FITS			86.99	.002
5 CLEAN-UP	33.62	.015	1,068.38	.022
7 LOST TIME	39.29	.018	1,991.26	.040
TOTAL DIRECT LABOR COST	$ 8,351.12	$3.738	$179,739.29	$3.642
11 SALARIES and WAGES - SUPVR. and TECH.				
12 INDIRECT PRODUCTION LABOR	$ 56.30	$ .025	$ 2,114.26	$ .043
22 VACATION, HOLIDAY, and OTHER PAY ALLOWANCES	104.30	.047	1,717.93	.035
30 SUPPLIES	152.50	.068	2,628.13	.053
31 TOOLS, JIGS and DIES	2,300.00	1.030	65,582.40	1.329
32 WELDING ROD				
34 GASOLINE, OIL and GREASE			2,581.85	.052
42 SPOILED WORK	1,455.72	.652	16,730.76	.339
50 MAINT. and REPAIRS - MECH. EQUIP.	3,150.43	1.410	32,492.49	.658
51 MAINT. and REPAIRS - ELEC. EQUIP.	134.00	.060	4,697.13	.095
54 DEPRECIATION	1,783.92	.798	15,404.99	.312
TOTAL OPERATING EXPENSE	$ 9,137.17	$4.090	$143,949.94	$2.916
TOTAL LABOR AND OPERATING EXPENSE	$17,488.29	$7.828	$323,689.23	$6.558
UNITS PRODUCED BY THIS DEPARTMENT	223,400		4,935,305	

DATE

BY

COPIES TO:

EXHIBIT 4

our cost analyst found that the system was changed, no one was using the two detachable sheets and that a simple cardboard tag was all that was needed. This cut the printing cost approximately in half. I dare say this waste could have gone on for some time had not the budget control system brought it to light.

We also had a similar case in the accounting division. In billing interplant shipments the system of controls set up required an invoice set of seven copies. Later it was found that the system could be considerably simplified and the number of copies was cut down to three. The billing clerk continued to use up the forms on hand and when she withdrew an entire set four copies were simply discarded, since the design of the set made it impractical to use all copies. No one was too concerned about losing the extra copies which had already been printed and charged to expense as the cost saving from the new system more than paid for it. However, in the course of checking departmental costs, I examined the printing order which normally would not have been brought to my attention. Upon checking it, I noted that seven-copy sets were still being ordered and that the supply clerk was simply reordering without checking to see if the form was still in use. Reducing the set to three copies accomplished considerable reduction in the supply cost charged to the accounting division.

Until we had actually established budgets I had always thought that I was running my department at the lowest possible cost. However, I have been very much surprised to find how much more interest I take in supply costs, overtime costs, and office machine costs when I know I am going to be called upon to explain why I did or did not meet the budget established.

Administration of the Plan No Easy Matter

Substantially better accounting records are a by-product of such a plan as has been outlined. This is because of the more careful reporting of labor and supplies by foremen. But this is not all there is to the matter. Reporting needs watching. A discussion of any plan would not be complete without giving some thought to the pitfalls or disadvantages which we know must exist in some form or other, unless perfection has been achieved. For instance, a battle of wits between the foremen and the accountant takes place unless great care is exercised. The foreman, instead of really seeking cost control, may simply be trying to be very careful in his reporting in order to avoid having his department charged with anything which might show up as bad budget performance. These instances of such wrong reporting must, therefore, be guarded against. Examples are:

BUDGET PERFORMANCE NOTICE

Department No. 702 Name Cutting Date _____

Department Head _____

Direct Labor (For Direct Labor Departments Only)

Direct Labor Cost Budget for Month of June was	$ 3,625
Adjusted for Actual Production to	$ 2,737
Actual Direct Labor Cost for Month was	$ 2,773
This is Under or (Over) the Budget by	$ (36)
The Direct Labor Budget for July is	$ 3,320
The Direct Labor Budget for August is	$ 3,320

Departmental Expense

Expense Budget on Scheduled Production for Month of June was	$ 5,730
Adjusted for Actual Production to	$ 4,050
The Actual Expense was	$ 4,134
This is Under or (Over) the Budget by	$ (84)
The Expense Budget for July on Scheduled Production is	$ 5,075
The Expense Budget for August on Scheduled Production is	$ 5,075

A detailed report on the actual expense will be sent to you within a few days.

EXHIBIT 5

1. Scrap losses are sometimes unaccounted for because the foremen do not record parts spoiled but simply throw the spoiled work into a scrap bin.
2. Parts produced counts are sometimes reported incorrectly to show greater production than actually occurred.
3. Cost reduction campaigns sometimes result in premature revision of standards either for material or labor because of a misguided zeal on the part of the person charged with responsibility for cost reduction.
4. Labor may be deliberately charged to another department as a means of directing the charge to another cost center.
5. Some foremen conclude that, if they report all of their labor as far as possible on some production job order, their lost time will disappear altogether. It must be pointed out to them that, in so doing, the cost of their direct labor per unit increases above the standard and, as far as budget performance is concerned, they accomplish nothing.

In addition to distortion of costs the above practice may contribute to inventory shrinkages and will thus affect balance sheet valuations.

Accountants must make management realize that the prime factor in the successful operation of cost management is administration. Very, very often cost control systems and other accounting systems fail because the importance of administration has been overlooked. Then the systems man, or the staff accountant who put in the system, is criticized for failure in the design of a system. We must keep this in mind as we continue to "sell" administration of the plan. The accountant in charge must constantly strive to make the participants and their immediate superiors, the factory superintendents and managers, realize that it is their plan, their tool, and not the accountant's.

Administration is also concerned with keeping the cost control and reduction plan understood by participants. All instructions and explanations of expense accounts should be in written form and kept up to date. New foremen should be contacted and the plan fully explained to them. Interest must be stimulated by making periodic visits to each foreman. It is very important that the confidence of everyone concerned must be maintained and very often shop people mistrust the accountant because they do not understand his terms. It is very easy to assume that because accountants understand fixed, variable, running average, etc., everyone else does. These terms may be as vague to shop men as shop terms often are to accountants.

It would be nice to be able to conclude this paper by asserting that departmentalized management of costs is simply a case of following well developed principles and policies. On the contrary, every business is a special case and the introduction of departmentalized control in any given business raises specific problems for which no solution can be given in advance. As general guiding principles, I believe it is correct to state that the budget administrator should take two essential steps: (1) carefully analyze past data available and determine the cost behavior of the business and (2) prepare adjustments as needed to the accounting plan, the assembling of underlying data and, above all, to the organization itself.

Chart Books for Better Guidance of Operations

by D. A. LIVINGSTON

Statistician, Monsanto Chemical Company, St. Louis, Missouri

Accounting has been defined as the eyes of management. How the findings of the accounting "eye" can be presented to the management eye in the form of simple and quickly assimilable graphs on ordinary arithmetic scales is the theme of this case study. The key graphs used by a large company are reproduced and briefly discussed.

OUR COMPANY, LIKE OTHERS IN THE CHEMICAL INDUSTRY, has shown such a large growth in the past two decades that management has had to rely more and more on statistical summaries and illuminations as aids in the control of company operations. Charts, tables, and statistical reports of various kinds not only streamline presentation but they minimize the time required by management to locate significant relationships and trouble spots which may not be so apparent in the bare figures. This work which a statistician performs in our accounting department under the authority of the company comptroller, may be divided, for purposes of this discussion, into three phases:

1. Preparation of financial and operating charts for managment.
2. Regular periodical statistical reports and special studies.
3. The construction and presentation of indexes of company and divisional raw material costs and product prices.

FINANCIAL AND OPERATING CHARTS

Managers find it necessary to view current conditions in relation to past developments to get a clearer perspective for planning. This requires consideration of data covering longer time intervals than those covered by the usual form of balance sheet or income statement. We have found that charts serve to accentuate and clarify these long term relationships among various aspects of a business much more effectively than would tabulations of the corresponding figures.

Our Chart System

Our chart program is composed of three basic series which are directed to the three top levels of management: The executive committee, the board of direc-

tors, and managers of the seven operating divisions of the company. The first of these series, the director's charts, consists of six which are graphic income statement summaries prepared quarterly to cover the operations of the company and its consolidated subsidiaries. The executive committee chart book series consists of about 110 annual and monthly charts and the accompanying tabular data. These charts encompass a broad range of ratios which highlight the operation of the company and its subsidiaries, as well as interdivision performance, and compare Monsanto's results with other leading companies in the chemical industry. For each of the seven divisional managers there is a divisional chart book, which has between 30 to 37 monthly and annual charts and tables which review the operations of a division.

For the purpose of making it easier for top management to read and interpret these charts and make comparisons, there has been a deliberate effort to standardize the basic types of charts used in the executive and divisional books and to maintain a uniformity in their graphic composition. The order in which the charts appear in the chart books follows a sequence of logical analysis. In other words, there is a step by step graphic exposition of the related factors of income, cost, and investment which shape the overall picture. The accompanying exhibits demonstrate the organizational pattern of a typical divisional chart series and the graphic characteristics of a few of the basic charts.

The first exhibit is an outline of the scope of the charts prepared regularly for the three top levels of management. Specifically, it is an outline of a divisional operation chart series for operating division managers. However, charts for the other two top levels of management follow the same general plan.

Each underlined entry on Exhibit 1 identifies a type of chart. It will be noted that the return on average investment occupies the peak in a pyramidal arrangement of the charts. It has been an accepted company policy to consider return on investment employed in the business as the prime measure of management effectiveness. The two sides of the pyramid proceed along separate lines of investment income analysis, which converge in return on average investment. On the left, average investment is broken down in terms of the ratios of its main component: fixed property and inventory. On the right side is an investigation of the separate stages leading up to net income which, taken in relation to the other variable—average investment—determines return. The relationship of cost of goods sold to sales is charted for each plant and department as well as for the division in order to differentiate the sources of cost-income changes. Furthermore, volume, cost, and income figures are presented graphically for the major products of each division.

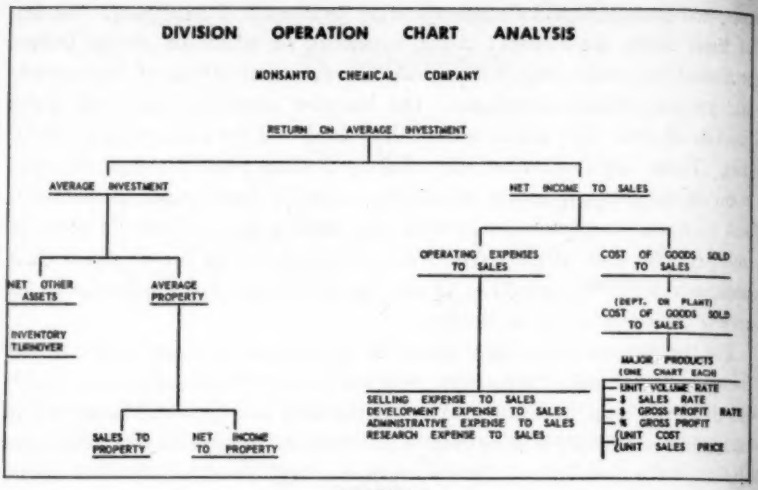


EXHIBIT 1

Charts Utilizing Asset Data

Return on Average Investment, our prime indicator, is the subject of the chart shown on Exhibit 2. It will be observed that the lines symbolizing per cent return on average investment, before and after taxes, move in a downward direction for the total period charted. However, despite the sharply rising average investment since 1946, per cent return before and after taxes moved upward with the exception of 1949. It is evident also that most of the added investment has been in fixed property represented by the lighter portion of the bars. As Exhibit 2 illustrates an annual change, so Exhibit 3 depicts a monthly one on the same ratio, return on average investment. It is a sample of the kind of chart which is done for the other ratios in this series. The fluctuation of the monthly figures in the two years' chart contrasts with the smoothness of the same figures when expressed on a year to date annual basis in the chart beside it. Such a dual presentation of monthly data enables the observer to separate seasonal or irregular fluctuation from cumulative annual results.

It will be found, with Exhibit 4, that we have resorted to the bottom of the left side of the outline in Exhibit 1 and are dealing with the ratio there indicated. In this sales to property chart, the property bars are steadily rising and the line depicting the ratio of sales to property also follows an upward course. Thus, even with this accelerating rate of investment, particularly in fixed assets, sales growth has tended to keep pace with property growth for the total period.

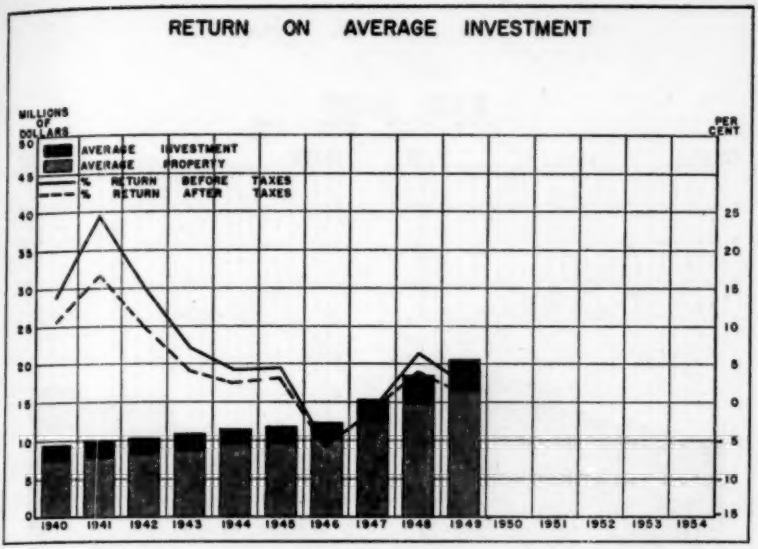


EXHIBIT 2

But perhaps it is not enough to keep pace. It is important for management, however, through following monthly as well as annual developments in this ratio, to trace any gradual progress being made toward capitalizing on property additions through expanded sales.

Charting Operating Ratios

Turning to the net income side of pyramid represented by the outline, the first ratio under return on average investment will be seen to be net income to sales. It is the subject of Exhibit 5. The solid line showing the ratio of net income (before taxes) to sales is an indicator of the extent to which cost of goods sold and operating expenses have been moving in relation to sales. The effect of the 1951 tax rate stands out in the falling off of net income after taxes in 1951, despite a gain in the ratio of net income before taxes for the same year. The bars emphasize aggregate dollar variations in the segments of net income before and after taxes.

To examine the sources of changes in relationship of net income before taxes to sales, it is necessary to study separately the ratios of cost of goods sold to sales and operating expenses to sales. The division on Exhibit 1 immediately below the legend, "net income to sales" is indicative of this. Reading further down on the outline, it will be clear that each of the components of operating

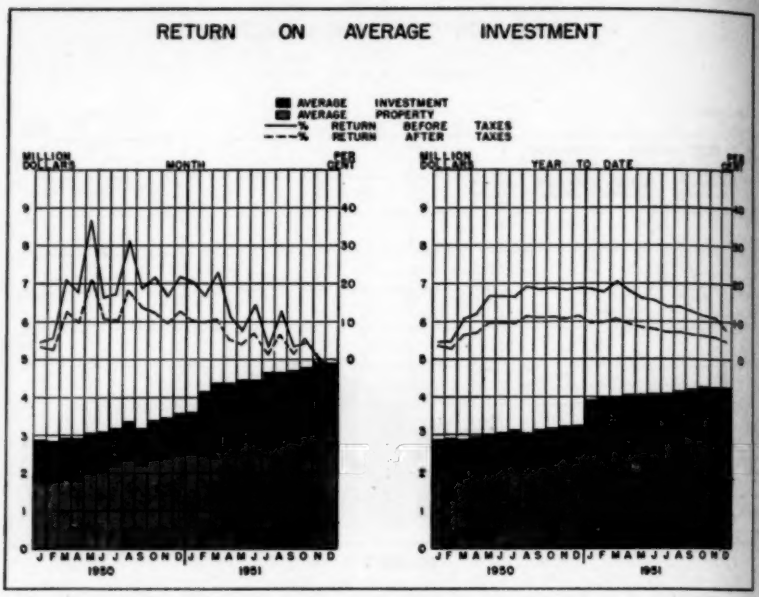

RETURN ON AVERAGE INVESTMENT
AVERAGE INVESTMENT
AVERAGE PROPERTY
% RETURN BEFORE TAXES
% RETURN AFTER TAXES
MILLION DOLLARS
MONTH
PER CENT
YEAR TO DATE
J F M A M J J A S O N D J F M A M J J A S O N D
1950
1951

EXHIBIT 3

expense, selling, administrative, development, and research—is charted in relation to sales in order to shed light on proportional variations in operating expense. Space does not permit carrying the presentation here so far. However, as we give attention to charts relating to cost of goods sold, it is well also to keep in mind that expenses, too, receive chart treatment.

The relationship of cost of goods sold to sales requires careful watching by management, in that cost of goods sold embraces labor and material costs which, together, constitute the largest part of total costs. In the annual chart shown as Exhibit 6, there is evidence of an upward pressure on the ratio of cost of goods sold to sales to 1946, followed by a marked decline in this ratio in 1947 and relative stability thereafter. Each bar depicts sales, with the portion below the white mark representing cost and the upper segment gross profit. Exhibit 7 shows monthly actual and year to date charts of cost of goods sold to sales, displaying to management the shorter term movements which are specially significant for this highly strategic ratio. Gross profit margins may be examined in greater detail through cost of goods sold to sales charts available for each of a division's major products, for any thorough investigation of the earning power

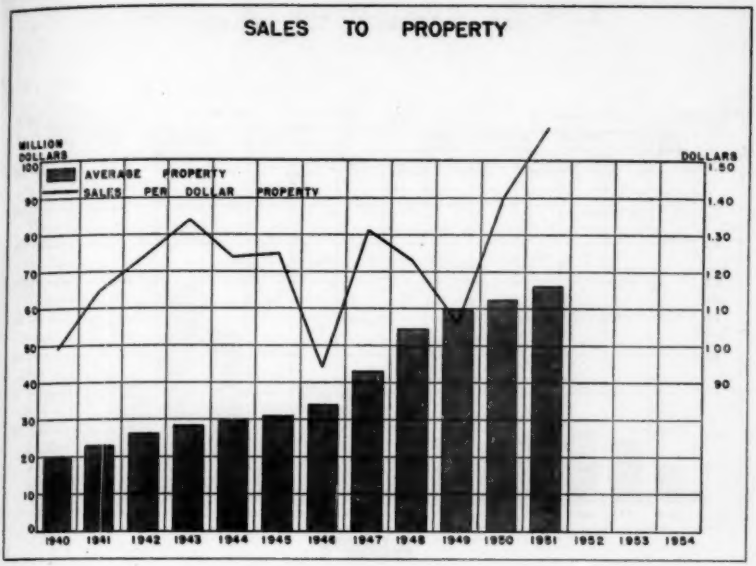


EXHIBIT 4

of a division must be pursued back to the cost-income behavior of individual products.

The product chart, which is the final one shown (Exhibit 8) to exemplify divisional management's chart book, is an illustration of the many charts kept on the main products of each division. On this one page of five charts and six curves, there is a graphic summary of the performance of one product in sales, physical volume, gross profit, unit price, and unit cost. The unbroken lines depict actual annual figures. The points marked with an X are the quarterly totals on an annual basis. Through the top two component charts, it is possible to compare changes in volume rate in pounds and sales rate in dollars. The dollar gross profit rate and the ratio of gross profit to sales appear in the next two charts. The chart at the bottom of the exhibit brings out the movement of unit prices and unit costs. A group of charts of this kind reveals, among other things, the impact of price changes on sales volume or the effect of an increase or decrease in unit volume on cost and gross profit.

This has been a very cursory survey of a division manager's chart book. It does, however, exemplify the theme of simplicity, uniformity, and logical arrangement which we have sought to accomplish in the presentation of these

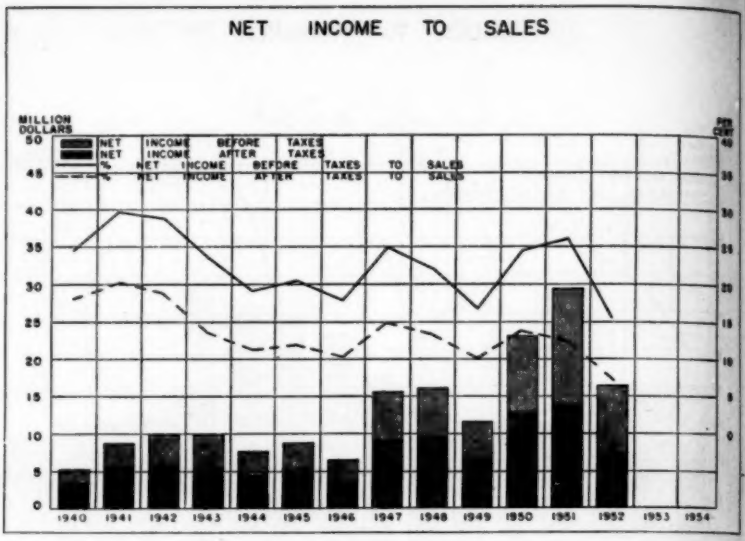


EXHIBIT 5

charts. It is, of course, recognized that, while these charts may raise questions concerning tendencies toward strength or weakness in operations, they are aids and not substitutes for a painstaking analysis of accounting or other facts which may be at the roots of successes or failures.

STUDIES AND INDICES

Attention is now to be directed to the second and third categories of statistical development of accounting data, as availed of in our company. These relate to studies and reports and to indices.

Special Studies of Internal Relationships

The second phase of our statistical program may be referred to under the general heading of regular periodical reports and special studies. These individual reports convert into statistical form, data from one or several sections of the accounting department, such as cost, budget, sales, or corporate accounting. The responsibility for the initiation of any report and for its form and content rests in the comptroller, who adopts a report either as a result of his own recommendation to management or their suggestion to him. One of the main func-

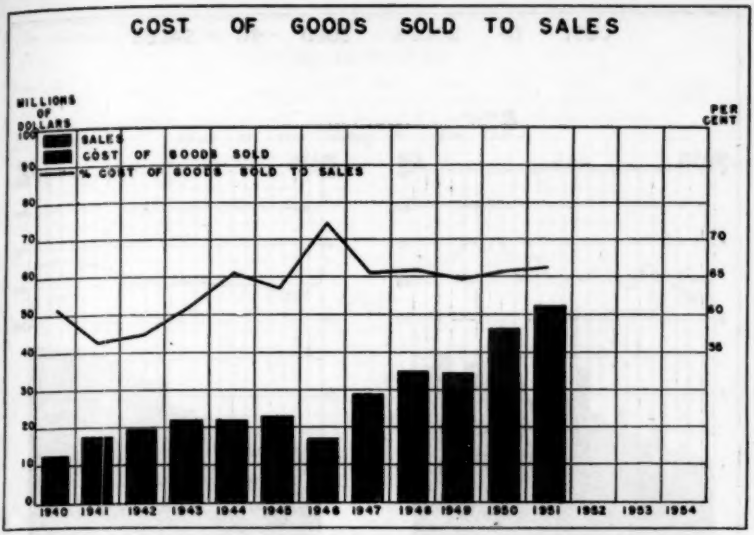


EXHIBIT 6

tions of the statistician is to propose to the comptroller methods of improving existing reports as well as to suggest new types of reports.

Many of the statistician's special studies have developed into periodical reports, but the studies, as such, are usually nonperiodic or nonrecurrent. It would be impractical to describe here all the periodical statistical reports in effect at present. It may be interesting to give a brief description of three typical reports which enhance management's insight into important areas of the company's operations.

The first of these reports, the percentage of actual to rated capacity operations, is issued monthly and is one page in length. The ratios derived from the product of actual output times standard cost divided by the product of rated capacity output times standard cost, are listed for each plant, and division, and for the company as a whole. These ratios are shown for the current month and the previous five months. A line chart depicts the monthly turnover rate of the company during the six months period. Such a report on utilization of capacity will have a bearing on any cost variances which may be showing up between actual and standard costs. It may also be studied in relation to breakeven or budget calculations. In general, the capacity operation report has ramified impli-

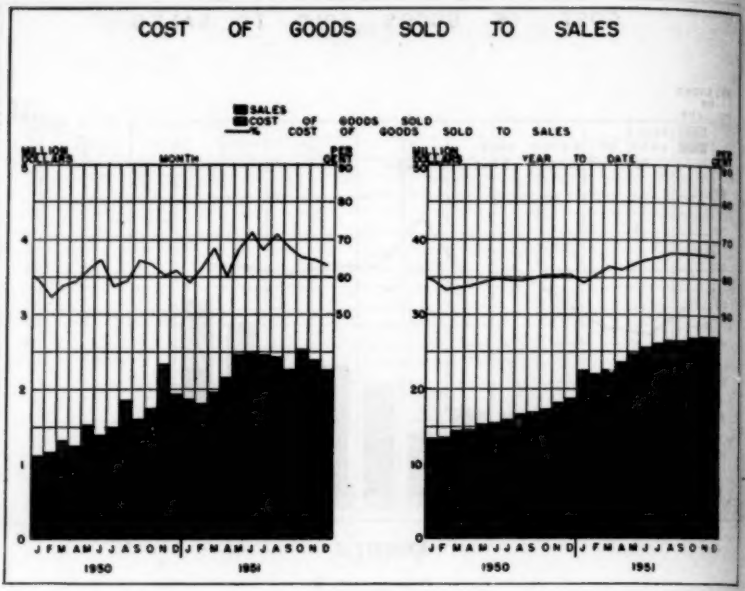

COST OF GOODS SOLD TO SALES
SALES
COST OF GOODS SOLD
% COST OF GOODS SOLD TO SALES
MILLION DOLLARS
MONTH
PER CENT
YEAR TO DATE
J F M A M J J A S O N D J F M A M J J A S O N D
1950
1951

EXHIBIT 7

cations in the fields of production planning, cost control, and even quality control.

Another type of report which deserves special attention here is the comparison of inventories by divisions and by inventory classification. This report, prepared each month, lists the dollar inventory totals for each division of the company according to the following inventory classifications: Finished goods, raw materials, stores and supplies. There is then a summation of the inventories in each division and the whole company. Adjacent to the current month inventory figures are two columns which designate the increases or decreases in inventory over the previous month and over the current month of the previous year. Each of three charts embodied in this report expresses dollar inventory in bars and the turnover rate per year in a line. The first chart sketches month-end inventory and turnover rate per year, based on monthly cost of goods sold, performance on an annual basis for the company, for the current month and eleven previous months. In the second chart, period-end inventory and turnover rate per year, based on year-to-date average inventory divided into year-to-date cost of goods

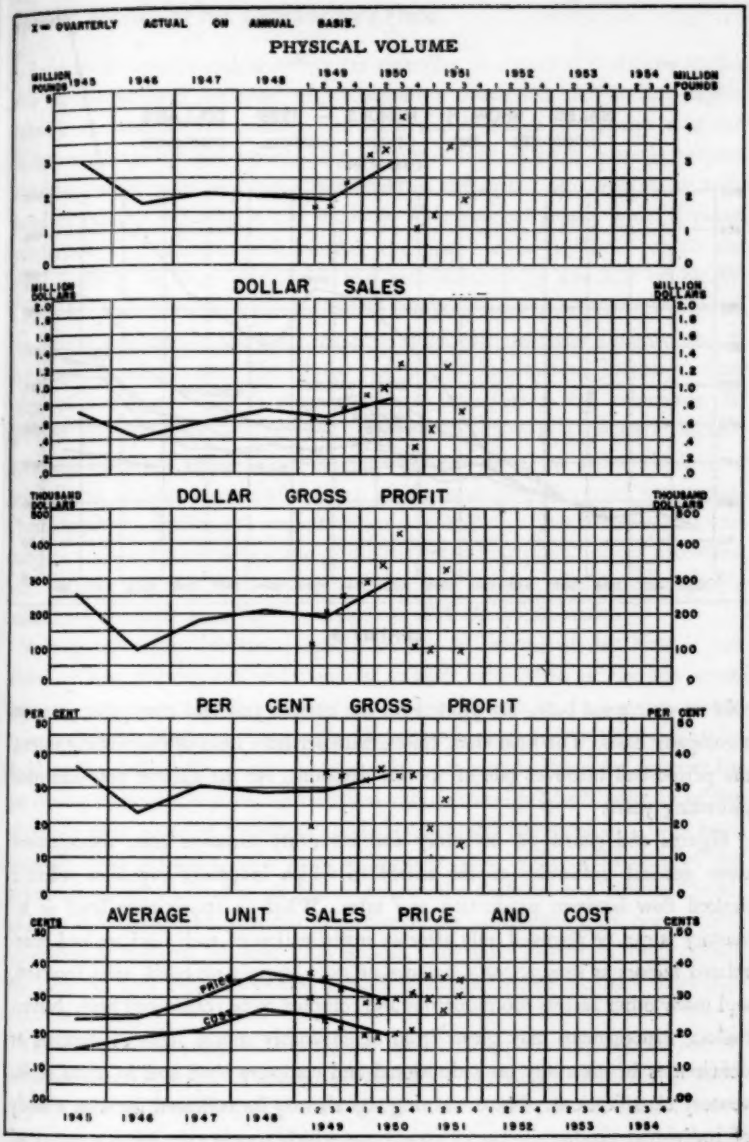

X = QUARTERLY ACTUAL ON ANNUAL BASIS.
PHYSICAL VOLUME
MILLION POUNDS
1945
1946
1947
1948
1949
1950
1951
1952
1953
1954
DOLLAR SALES
MILLION DOLLARS
DOLLAR GROSS PROFIT
THOUSAND DOLLARS
PER CENT GROSS PROFIT
PER CENT
AVERAGE UNIT SALES PRICE AND COST
CENTS
PRICE
COST

EXHIBIT 8

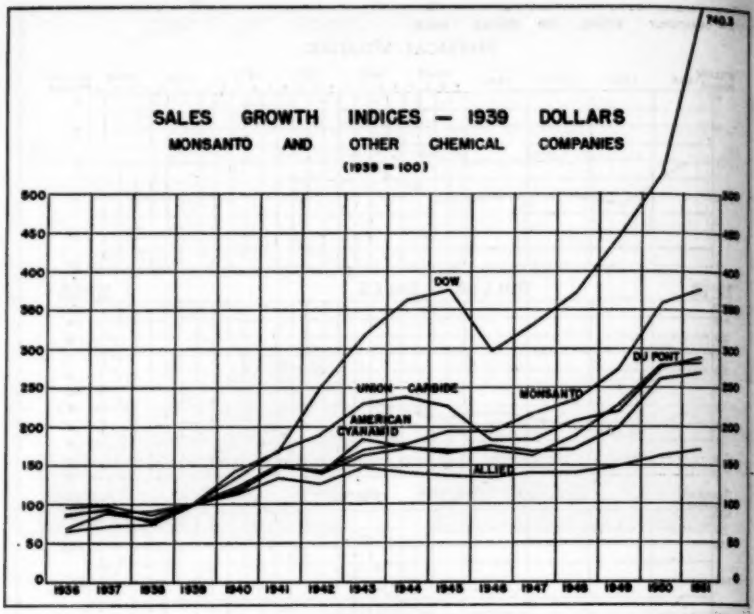
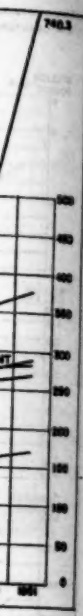


EXHIBIT 9

sold on an annual basis, are plotted for the current year and nine prior years on a company basis. The final chart traces, with separate lines of contrasting colors, the period-end turnover rate of specific divisions, for the current year and nine preceding years.

Figures and charts on inventory and inventory turnover offer management some general indication of the extent to which inventory pipelines reflect a desired flow between production and sales. What an appropriate level of inventory is can be resolved only after an investigation of such intricate and interrelated factors as storage costs, balance of stock, supply on hand, sales forecasts, and many other factors too numerous and complex to be considered here. Nevertheless, management may glean from an inventory report signs of excesses or deficiencies in inventory on a divisional and company level and in terms of inventory classifications. These warning signals may be followed up with a study of individual product inventory conditions which supply the ultimate source of control.



Special Studies of the Competitive Field

Reports on capacity and inventory are examples of statistical yardsticks applicable in the internal appraisal of a company's operations but, in any highly dynamic and competitive industry, the business progress of a company must also be measured against the achievement of competitors. That is why we prepare statistical comparisons of Monsanto's financial and operating performance with those of other companies in the industry. One type of report is the detailed comparison of Monsanto with another chemical company. These reports are done quarterly on some companies and semi-annually or annually on others. The tables and charts in these individual company reports include fewer ratios but follow substantially the same sequence of income statement analysis used in the executive chart books. The tabular and graphic information, covering a time range of five to ten years in these reports, is interspersed with comments. In addition to the individual company comparisons, there is a quarterly income statement summary which sets forth earnings per share, net sales, net income before taxes, and net income after taxes, of Monsanto and nine other companies. These quarterly figures are expressed on a cumulative year-to-date basis and compare current figures with those of the corresponding period of the preceding year. This summary offers management a brief overview of our company's cumulative quarterly standing in comparison with other companies.

Among the more interesting special studies in process at this time is one which reviews the income and financial growth since 1936 of the top seven chemical companies. Exhibit 9 sketches the sales growth of these companies in index numbers. The underlying sales figures were converted to 1939 dollars by dividing the dollar sales of each company for each year by the index number for the corresponding year from the chemical and chemical products segment of the wholesale price index of the Bureau of Labor Statistics converted to a 1939 base. Since an ideal deflator in the form of separate price indexes for each of the companies is not obtainable, we had to rely on the chemical and chemical products section of the B.L.S. index to arrive at an approximate, if not precise, expression of sales in constant 1939 dollars. The sales growth in 1939 dollars was then put into index numbers, with 1939 as the base to facilitate chart presentation.

This telescoped survey of our regular statistical reports and special studies necessitates our omission of any discussion of the procedures employed in other projects, such as breakeven charts and budget charts. In spite of its limitations, this cross-sectional view may afford some intimation of the actual and potential scope of our statistical reports.

Developing New Indexes for Product and Raw Material Prices

The development and refinement of government prices indexes in recent years has been a boon to economic analysis. In these indexes the statistician, economist, and financial analyst has acquired, not only a practical barometer of the magnitude, interrelation, and interaction of prices but also a key to open the economic door which obscures the distinction between the real and monetary aspects of business activity. Price indexes constructed from sales, raw material and labor cost data can serve similar purposes in an industrial corporation. Management, in order to see behind the screen of dollar variations, will benefit from these price indexes as deflators and as gauges of relative sales—cost—price behaviour.

Monsanto has had selling price, raw material, and wage indexes which extend from and were based on the year 1939. These indexes have been published regularly in the company annual reports. It was decided this year to revise the present indexes and convert them to a 1947-1949 average price base. This new base seemed more acceptable, since it would make it possible to incorporate a larger proportion of our present raw materials and products in the base and would move the base period closer to current and forthcoming price conditions. Furthermore, this 1947-1949 average base parallels the base period employed in the new wholesale price index of the Bureau of Labor Statistics.

The sample among about four hundred products and an even larger number of raw materials will cover on the average between eighty-five per cent and ninety per cent of annual dollar sales and dollar raw material costs. In the selection of products to be included in the index, we suggested the exclusion of products which yielded consistently less than $100,000 in sales volume per year since 1939. The raw material minimum figure was set at $50,000. Both of these standards were adopted after consultation with the comptrollers of each division of the company. Exceptions to this standard were advised in those divisions where a number of smaller volume items was required to give ample weight in the aggregate sample. Care was also taken to secure an adequate sampling from the various product and raw material groups. The formula which we are likely to use, although we are testing others, will be weighted in current year sales quantities and current year raw material quantities.

These indexes, when they are completed, will be issued monthly as well as annually for each division and for the company. The monthly samples will necessarily be smaller in order to conserve time in the gathering and computation of the data.

It may be observed, in conclusion, that the financial and operating charts,

reports, and the indexes have been tailored to one major objective: The needs and understanding of management. As comprehensive as this program may appear we are of the opinion that it is only a beginning of the broadening and deepening process that lies ahead in the better communication of accounting information to management.

It is known, in particular, that the road to use of statistical techniques appears to be broadening markedly and that it may lead to destinations now hardly in sight. However, the use of charts is already firm ground for the accountant and for management. So is the development of reports correlating operating trends. So, too, are some uses of indexes. To these gains, as pertinent in the current situation of business, this article has been devoted.

THE COST FORUM

RATIO ANALYSIS

Editor, N.A.C.A. Bulletin:

"SOME GUIDES TO LONG TERM PLANNING" by Mark W. Cresap, Jr. which appeared in the *N.A.C.A. Bulletin* early this year (January, 1953) includes special mention of significant ratios and their use in planning. The author suggests a method of computing ratio of net income to plant investment and a method of computing the rate of return on total invested capital.

The ratio of net income to plant investment, Mr. Cresap suggests, should include gross fixed assets instead of the net amount remaining after depreciation. However, the author's intention to thereby "inject a rough adjustment factor to provide some equalization of facility values of various divisions of a company or of comparable companies . . . between those with old plants built at relatively low cost and those with new plants built at high cost," is hardly accomplished. The ratio seeks to measure returns on plant investment. If it is desirable to eliminate the accident of time for comparative purposes, an appraisal of values at a common date may be used. This may establish an equalization of dollar values in plant at one time. However, gross plant as distinguished from net plant does not equalize the value of plant even roughly. It merely loosely adjusts time when the real difference is time dollars.

Some consideration should also be given to the amount of depreciation expense and maintenance costs included in the computation of the net income. Here again, distortion enters into comparative studies, because the dollar amount of depreciation is affected by the dollar values at the time plants are constructed. This may be significant if the expansion of a company occurs over a span of thirty or more years. The disparity does not seem to be eliminated by seeking to adjust for time alone. Time may well be the determinant of a variance in maintenance costs between plants but the time affects the use of current dollars included in the computation of the net income.

If this ratio is to measure the efficiency of use of invested capital, the invested capital must be established somewhat more carefully lest the resulting ratio seem to indicate accuracy which is only apparent. After all, invested capital in fixed assets is the unrecovered investment. This need not be the unrecovered cost distorted by time-dollars but the capital is not more carefully measured by using gross plant dollars nor are comparisons more reasonable thereby.

Another ratio which Mr. Cresap suggests indicates the use of total assets as the base for measuring return on total invested capital. This, the author suggests, considers profits in terms of return on total capital employed. This seems acceptable for its purpose if so defined. However, such a measurement should be supplemented by having a measure of the return on equity capital.

Company operations may well be examined in terms of financial management as well as in terms of using productive facilities. Some firms may very prudently trade on equity to the benefit of the stockholders. The source of the capital and the terms of the risk may then color the expected rate of return.

HOWARD F. GREENE, Boston Chapter

WHAT DOES OUR MATERIAL COST? —A NEW LOOK AT AN OLD PROBLEM

Editor, N.A.C.A. Bulletin:

AT FIRST GLANCE the answer to the question, "What does our material cost?" seems simple but, on closer examination, we find that several supplementary considerations immediately arise. Therefore, without attempting to arrive at a final, inflexible answer, let us review these considerations. They can have an important bearing in relation to establishing company policy for pricing.

From a practical operating point of view, the following costs all relate, at least in varying degrees of importance, to the cost of material:

1. Invoice cost.
2. Transportation costs.
3. Planning and production control costs.
4. Purchasing costs.
5. Receiving costs.
6. Incoming inspection costs.
7. Stores and warehousing costs.

Of the foregoing cost elements, the first two are generally accepted as material costs. However, the latter five ordinarily are not so recognized. Recently these five elements have come in for some discussion as "'supplementary material costs" and how they should be accounted for. It is this latter group that needs a more thorough examination and discussion.

In the writer's opinion, there are two arguments in favor of including as a real part of material cost any supplementary or additional costs necessary to get material ready to use or enter the first manufacturing process. First, it seems to be clear that more accurate material costs will be the result. If this theory is sound, then all costs of getting material either ready to feed into the first machine or ready for use on an assembly bench, or the same material ready to ship out as spares or service parts should be added to the invoice cost. This is especially true in cases in which expensive components, purchased to product specifications, are required for spare or service parts as well as for production. A second argument is that it's nearly always advantageous to allocate costs as directly as possible, regardless of other considerations.

To examine briefly the position that product costs will be more correct if the supplementary costs are treated as an additional specific cost of material, let us look at a situation in which two products have approximately the same dollar cost for direct labor, but one has only a small amount of material content and the other a high material content. The traditional method will assign to each product an equal amount of the "supplementary" material costs, through the usual application of burden based on labor. This is obviously incorrect because one product should be assigned a great deal larger proportion of the costs of getting the materials ready.

An accounting technique for handling these supplementary material costs can be very simply devised. It requires only the grouping together of the cost elements involved in getting the materials ready for first use and establishing a material burden rate (or individual standards for different functions, if considered advisable) calculated to absorb these costs. These elements then are assigned to each item of material when calculating costs, and also when materials are received, by use of the burden rate or standards previously established. Differences between the total amounts absorbed into cost of material, and the actual costs incurred for the material burden departments, will become a new and separately identifiable cost variance account.

The writer strongly recommends a wider adoption of this approach to "real" material costs.

HERBERT J. MYERS, *Los Angeles Chapter*

CLOSE CONTROL OF WASTE AND SECONDS

Editor, N.A.C.A. Bulletin:

THE COSTS OF WASTE and seconds generated in any manufacturing process are an integral part of the cost of goods manufactured. Their importance varies widely with different types of industry, but it is not uncommon to find five per cent or more of total costs attributable to these factors. Close surveillance, exercised over direct and indirect labor and other budgeted expenses, as well as material usage, can be quite surprising and remunerative when extended to this area.

A method of reporting and controlling these costs has been developed and applied to a plastics molding operation and has proved to be a real improvement over the former method of building allowances into the standard cost and permitting them to accumulate in inventory. This former practice revealed neither the extent of the loss nor the degree of adequacy of the allowance and, in addition, left too many excuses for favorable and unfavorable inventory variances. Moreover extensive additional tabulating was necessary to develop costs of actual waste and it was difficult to relate these to the standard allowances.

The improved method makes possible a presentation taken directly from the process transfer entries. This consists of an analysis, department by department, of the actual and standard losses due to waste and to seconds, and of the debit or credit balance of each for the year-to-date. It ties into appropriate variance accounts in the ledger. The loss or gain over standard is factual and cannot be discounted by those who do not wish to face results, as readily as non-accounting reports.

In order to secure the necessary data, the cost sheet was written with a separate column for waste cost and space for cost of seconds. Opposite each operational entry, where applicable, cost of waste was entered as a separate component of the total cost. Then, at appropriate stages, cost of seconds was entered in spaces provided, as an additional component. The cost sheet totals then consisted of a "prime cost", made up of material, labor and burden, and a "total cost", which included waste and seconds.

Next, the factory ledger was expanded to include the five components: material, labor, burden, waste and seconds, which made up the work-in-process inventory. The latter two categories represented standard value or standard cost of waste and seconds, as represented on the cost sheet. In addition, variance accounts were opened for waste and seconds.

In journalizing, production transfers—good production, seconds, spoilage, and waste—were recorded together at each stage. The delivering department was relieved of material, labor and burden in good production at standard and of actual quantities of waste and seconds at standard value. The receiving department was charged with this material, labor and burden in good production received and with standard cost of waste and seconds in it. The waste variance account was debited with actual and credited with standard waste. Likewise, seconds variance account was debited with actual and credited with standard seconds cost, balancing the entry.

After all production transfers were posted, the entries to the two respective variance accounts gave a complete account of performance in controlling losses due to waste and seconds by departments, and these accounts became the production report for the month and year to date without further analysis, showing standard versus actual performance. Revenue from sale of scrap and waste and of seconds was

also posted to these accounts, making the picture complete.

In any one department, the standard percentage cost of seconds or waste being known, the actual percentage for the month or year-to-date average may be determined directly from the relationship of this cost to the known standard percentage.

This method has provided what has proved one of our most valuable performance reports, as well as serving to keep our inventory clear of waste and second losses at actual quantity.

ROBERT M. RUETHER, *Albany Chapter*

PRICING SPECIAL ORDERS TO CONTRIBUTE TO FIXED EXPENSE

Editor, N.A.C.A. Bulletin:

THE TOPIC OF THIS LETTER requires two preliminary paragraphs. To start with, certain expenses are incurred merely by virtue of being in business and vary little, if at all, with the volume of sales. In the aggregate, they make up the "cost of doing business" and are the fixed amounts which must be paid out regardless of sales fluctuations, just to be able to continue to operate. If there is a very marked sales decline, as in a prolonged depression, then it is, of course, true that expenses previously thought fixed may be reduced. From this view, no expense can be said to be incapable of change, but, from a practical point of view, there are certain expenses which may be called fixed. Increases or decreases in sales have virtually no effect on the total fixed expenses. Thus per unit fixed expense varies inversely with sales volume.

There are other expenses which are variable, in that they vary more or less in direct proportion to the volume of work going through the plant. While the dollar total of variable expenses fluctuates markedly in relation to sales increases or decreases, obviously the per unit variable expense is virtually a constant.

The practical application of the foregoing arises in quoting on some particularly attractive large volume order on which competition is keen. Since the fixed expenses will not be increased if the order is accepted, it is reasonable to deduct from the cost for pricing, as computed by orthodox methods, an amount equal to the fixed unit expense. But it is equally important that this be the maximum amount deducted, as any further deduction would cut below the variable expenses and thus, inevitably result in a loss on the order. Even cutting down to variable expenses cannot be applied indiscriminately or the plant would soon be filled with orders on which no provision for absorption of fixed overhead expenses had been made. However, if the process is saved for the unusual case, the large and desirable but highly competitive order, then its value will be very great indeed.

To apply the method, it is necessary to know how much of the overhead is fixed. Each manufacturing expense account should be analyzed for this purpose. If current practice does not provide for it, the regular cost accounting procedure can be changed so that this determination is a simple routine matter. Although some accounts will be found to consist of both fixed and variable expenses, it will simplify accounting and prove sufficiently accurate for all practical uses if each account is considered as being entirely fixed or variable. Following is an example of how existing accounts might be classified:

Fixed

Indirect labor
Plant and equipment repairs
Building repairs
Insurance expense
Taxes
Depreciation—all accounts

Variable

Pay roll taxes
Light and power
Coal
Supplies
Expendable tools
Shop expense

As an application of the foregoing contentions, it is desired to quote on a closely competitive, desirable large order involving the following departments: Machine C, hand and machine finishing, weighing, inspection and packing, on which estimated unit costs are as follows:

	COST PER HUNDRED		
Department	Direct labor	Manufacturing expense	Total
66—Weighing	$ —	$1.3659	$1.37
56—Machine C	0.5827	.8221	1.40
68—Hand finishing	.6337	.3664	1.00
70—Machine finishing	.8170	1.6716	2.49
67—Inspection	—	1.0138	1.01
51—Packing	—	1.3927	1.39
			$8.66
Direct material			6.00
Total factory cost			$14.66

The above figures are, no doubt correctly set up and computed but the proportion of the manufacturing expense which is fixed and absorbed by the orders already in the plant need not be again absorbed by this order. Hence, for this particular order only, it will "help carry the overhead" if only *some portion* of the overhead expense is absorbed. How much is found as follows:

Department	Per cent of Manufacturing expense fixed	Total unit Manufacturing expense (As shown above)	Fixed unit Manufacturing expense this order
66—Weighing	87.7	$1.3659	$1.20
56—Machine C	63.4	.8221	.52
68—Hand finishing	63.6	.3664	.23
70—Machine finishing	76.6	1.6716	1.28
67—Inspection	86.8	1.0138	.88
51—Packing	51.7	1.3927	.72
Total			$4.83

The table above indicates that a maximum of $4.83 per hundred units can safely be deducted from the quoted price without resulting in any direct financial loss if the order is obtained. This price actually quoted will probably lie between the minimum so computed and the price as usually figured, but the important point to note is that a bedrock minimum quotation price is obtained, below which it is not safe to go.

As stated before, it is possible to set up a system for the routine segregation of fixed and variable manufacturing expense in each chart and indirect department. In order to retain the segregation of fixed and variable when indirect departments are distributed to the direct manufacturing departments, it is advisable to have all distributed expense accounts divided into fixed and variable.

Intelligently used, the method of estimating outlined here can be a valuable tool for the making of managerial decisions on pricing important orders.

EDWARD WAYGREN, *Newark Chapter*

A REVIEW OF ALTERNATIVES IN COSTS FOR PRICING PURPOSES

Editor, N.A.C.A. Bulletin:

A PRICING POLICY has been said to be an expression of a person's philosophy of doing business. In those cases in which cost figures are relevant to pricing, the accountant's concept of what cost is and how it can best be stated may materially affect this expression. To put the possibilities broadly, there are, basically, two types of cost figures used for pricing purposes—full costs and direct cost. These two methods of costing represent two different concepts of product cost. Under conventional accounting methods all the factory expenses, including materials, labor, and total overhead, both fixed and variable, are regarded as product costs. The selling and administrative ex-

penses are regarded as costs of the period in which they occur. Under direct costing, only the direct materials, direct labor, and the variable portion of factory overhead expenses are regarded as product costs. (John A. Beckett, "An Appraisal of Direct Costing," *N.A.C.A. Bulletin*, December 1951). The fixed portion of factory overhead, along with selling and administrative expenses, is charged off to profit and loss as expenses of the period.

Standards, and standard cost accounting are applicable to both these methods of accounting. A combination of standards and budgets makes readily available future costs which are so much more vital for pricing than are past or historical costs. Since it is likely that the prices for the current period will have already been set, it is the costs of the next period which will be used in pricing decisions. Pricing for catalogs is an excellent example of this.

Advocates of direct costing emphasize the adaptability of direct costs to marginal contribution approach. (W. W. Neikirk, "How Direct Costing Can Work For Management," *N.A.C.A. Bulletin*, January 1951.) Under direct costing the management of a firm which has peaks and valleys in production and sales finds that it has the cost information already available which enables it to determine how much contribution toward fixed expenses any proposed order will make. This makes it unnecessary to change the basis of computing price between peak periods and valley periods, because every order received can be computed on this basis.

A real problem may arise under direct costing where there are stages of completion between operations within the same firm. Because of the nature of the cost figures, the desirability and the possibility of profitably disposing of the product at an intermediate stage of manufacture may be overlooked and management may have alternatives of which it is not aware. Besides, it is the opportunity cost, that is, the cost of the product plus the profit that could be realized by selling it at that stage of completion, with which the next department should be charged. In a cloth mill that spins its own yarn, for example the cost of the yarn is really the price at which the yarn could be sold if it were not woven into cloth. For the problem of measuring the profitability of the weaving operations in order to decide whether to expand them or abandon them, it is this opportunity cost —the foregone revenue from not selling the yarn—which is relevant. (Joel Dean, *Managerial Economics*, Prentice-Hall) However, any attempt to value the product at such a figure in the records has the effect of writing up the inventories and any attempt to prorate full costs involves burden variances, both of which are contrary to the avowed purposes of direct cost accounting. Under direct costing the best approach to such problems of costing is to deal with them statistically. (I. Wayne Keller, "The Direct Cost Plan," *N.A.C.A. Bulletin*, September 1952, Section 3.)

Conventional accounting methods allocating full production costs to every unit of product, furnish cost figures which are perhaps useful in more different ways for process control than are direct cost figures. In fact, advocates of conventional accounting point out that, under an up-to-date standard cost system, the cost figures furnished management are broken down in such a way as to nulify any supposed advantages which direct costing may possess in the field of pricing. Even under conditions of marginal pricing, where direct costing is supposed to be most useful, the advocates of conventional accounting say that cost figures supplied by a standard cost system, when properly broken down into elements of cost, supply every element available under direct costing and are as fully and

easily usable. In addition to this, they contend that management is in a better position to act, since it is more completely informed by having full cost figures available that specify the amount of fixed costs which should be borne by the product under ordinary conditions.

There are three well-defined methods, resting on so-called full costs, of using cost figures to establish selling prices. The first of these is the time-honored per cent of sales method under which a per cent of cost or of selling price is added to product cost to arrive at the selling price. Despite lack of a theoritical basis, this method has simplicity to recommend it.

The second is the scientific approach to the per cent of sales method which is called planned yield on investment pricing. The object of this method is to secure a like return from the investment which consists of fixed assets and working capital. The return on fixed assets is obtained by application of a predetermined rate to overhead or conversion cost and the return on working capital by application of a predetermined rate to total manufacturing costs. These two are added to the product cost to obtain the selling price. Insofar as pricing one product is concerned, there seems to be little advantage to this approach but, where a full product line is carried, it could be of assistance in finding comparable prices among items. It is on this use that its claim to be an aid in selective selling is based. (Robert Beyer, "Pricing to Yield Planned Return on Plant and Working Capital Investment," *N.A.C.A. Bulletin*, October 1949.)

Under the third method, the manufacturing company is viewed as a service organization selling its services of converting materials. The base used for pricing purposes is the conversion cost of the product. Thus price is based on the amount of work done on an order, instead of on a per cent of total cost or selling price. An illustration, such as the one following points up the use of this method:

	Order No. 1	Order No. 2
Labor and overhead	$ 4,000.00	$ 1,000.00
Materials	3,500.00	7,500.00
Sales and administration	500.00	500.00
Total cost	$ 8,000.00	$ 9,000.00
Net profit	2,000.00	1,000.00
Selling price	$10,000.00	$10,000.00

Note—Example from Fred T. Heath, "The Philosophy of Conversion Cost Pricing," N.A.C.A. Bulletin, October 1949.

Assuming the firm to have $100,000 per period in conversion cost capacity, twenty-five orders such as Order No. 1 could be accepted on which the profit for the period would be $50,000. If orders such as Order No. 2 were taken, however, one hundred of these could be completed and the resulting profit would be $100,000 for the period. For the firm which is able to sell its production capacity, selective selling based on conversion pricing can be used and total profits for the period increased, even though the profit as a per cent of sales declines.

Direct costing stresses those costs which vary with production—direct labor, direct materials, and variable overhead. It tends to emphasize out-of-pocket costs. Per cent of sales and planned yield on investment pricing, both being based on full prorated costs, emphasize the investment of the stockholders regardless of whether it be placed in sunk or incremental costs. Conversion costing, based also on full prorated costs regards conversion cost capacity as the limiting factor of the concern and evaluates orders on the use made of this factor, thus stressing the opportunity cost of the product.

WEBB MEADOR, *Chattanooga Chapter*

SPEED-UP PLAN FOR CLEARING VENDORS' INVOICES

Editor, N.A.C.A. Bulletin:

THE PROMPT CHECKING of vendors' invoices is important for two reasons:

1. A steady flow of work to the vouchering operation is necessary to prevent work load peaks from developing at the end of the accounting period. This period is usually a calendar month in most companies.
2. Delays in clearing may result in loss of cash discounts in substantial amounts. Many vendors allow substantial discounts when the invoice is paid within ten days from invoice date. Incidentially, lost discounts may not be included as an item of cost for price redetermination under government contracts.
3. Failure to take discounts and to pay invoices on time will impair the credit standing of an otherwise strong company.

For a number of years, our company followed the conventional procedure in this matter. Invoices were delivered daily from the mail room to the purchasing department where they were checked with the receiving report and the office copy of the purchase order for correctness of quantity and price. This operation usually required a minimum lapse of one working day, after which the work was then passed to a group in the accounting department who checked the correctness of charge account numbers and extensions. Considering other work for which this group was responsible, it was often very easy to lose a second day in the sequence of operations. Many times a buyer would request an invoice for review and then become busy and overlook returning the invoice for several days. Personnel assigned to the task of checking were often caught in the whirlwind of a peak purchasing load and drafted into a seemingly more important job. All of this resulted in very spotty clearing and a heavy load for the vouchering group at the end of the month.

After several attempts, we succeeded in overcoming the problem by combining the clerical side of the purchasing department operation with the accounting side and assigning the operation to a new clerical group operating under the supervision of the accounting department. This group is now known as our invoice clearing group. (It should be noted at this point that the two departments are ideally situated geographically for this consolidation, since they are both located adjacent to each other on the same floor of our general office building.)

The functions of this newly organized group are as follows:

1. Custodianship of all office copies of purchase orders.
2. Custodianship of all receiving reports from which receivings are recorded on office copy of purchase order.
3. Running an adding machine tape, upon receipt of invoices from the mail room, establishing a control total which follows the lot through to the vouchering operation.
4. Checking invoices with purchase order and receiving report for correctness of price and quantity. The receiving report is then stapled to the vendor's original invoice. Additional copies are passed on to the buyer or destroyed, depending upon requirements.
5. Inserting standard price by rubber stamp in space provided, on face of invoice. Product code is also inserted for allocation of material price variance at the vouchering operation, extensions are checked and the total standard cost is computed and inserted in space provided.
6. Passing invoices to the machine vouchering group for processing.

The result of this change has been prompt and speedy clearing of invoices for vouchering which, of course, has leveled out the work-load and kept to a minimum the month-end peak on the vouchering operation. Needless to say, clearing time has been reduced from two or three days to one day.

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